ENGINEERING NEWS-RECORD

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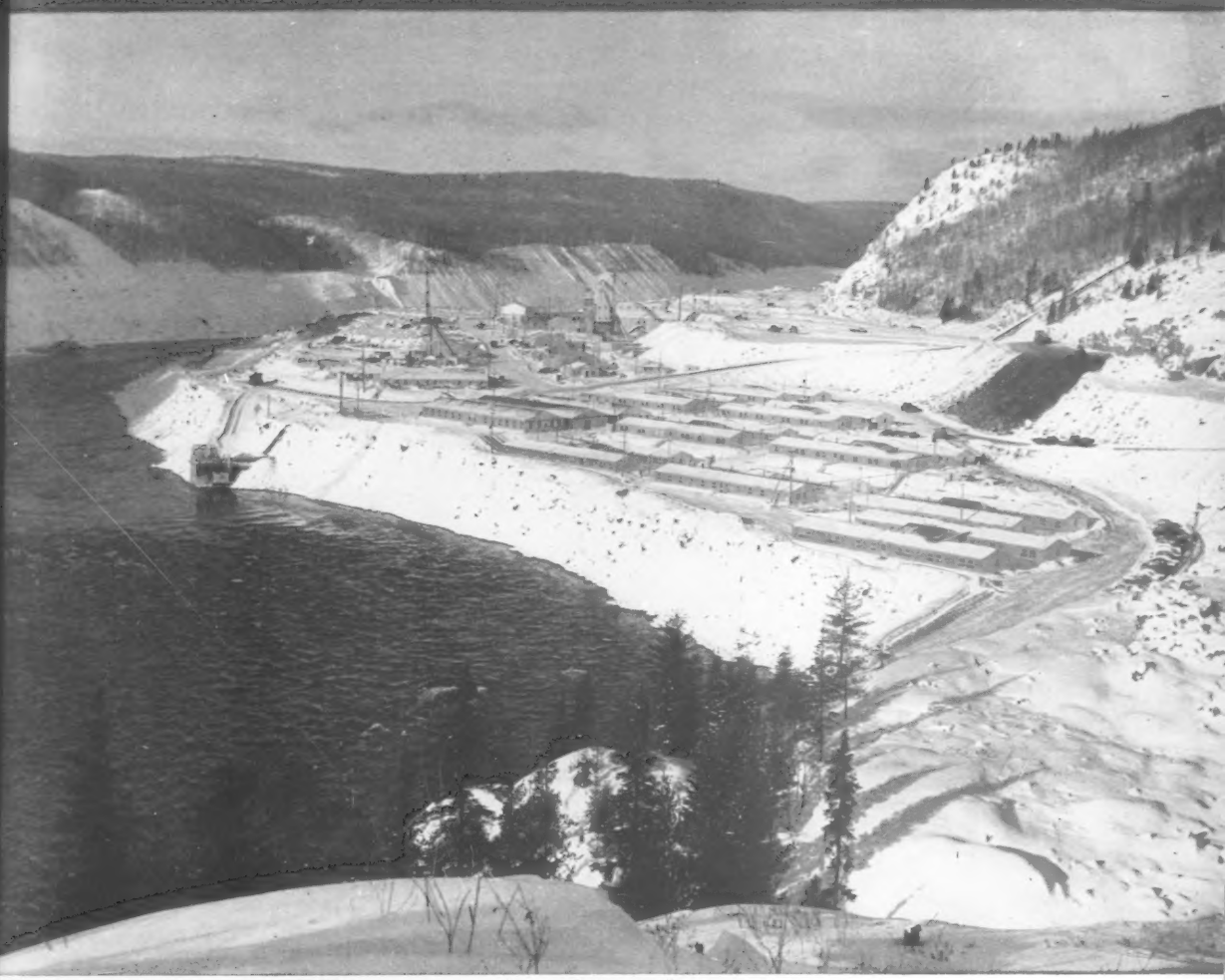

Winter sets in—this job goes on p. 42

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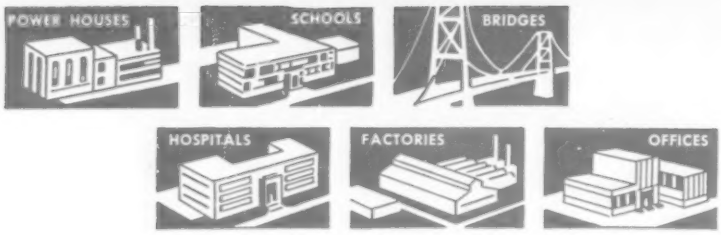

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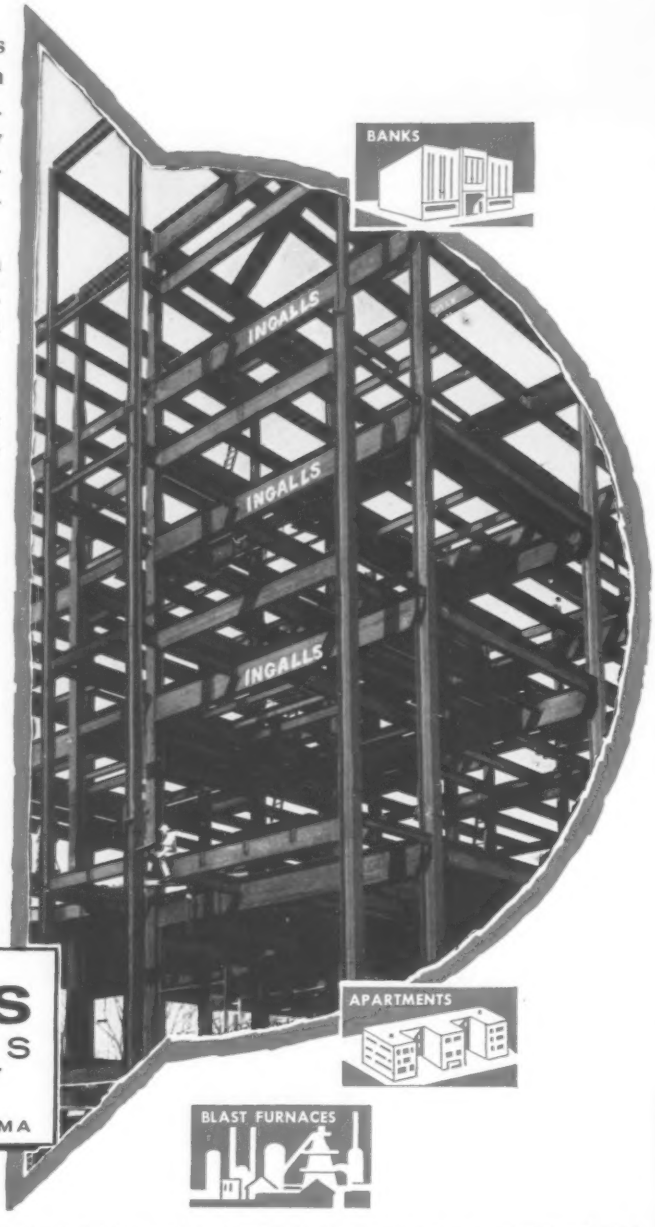

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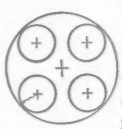
NO OTHER ENGINE IN MURPHY'S SIZE AND POWER RANGE CAN GIVE YOU ALL THESE FEATURES

"TRUE" DIESEL OPERATION—Unlike most other small diesel engines, Murphy Diesels operate as "true" diesels. This advantage comes from Murphy's Unit Fuel Injection, open-type combustion chamber, and other advanced design features.

INSTANT RESPONSE WITH HIGH-RISING TORQUE—Murphy's exclusive Hydraulic Servo-Type Governor harnesses lubricating oil pressure to adjust injector controls for instantaneous response to load change. It means more tons per hour.

LOWER FUEL CONSUMPTION—The combination of Murphy Diesel's plain, open combustion chamber and unit fuel injection assures *complete* combustion. You get maximum power from each drop of fuel, with less engine wear, and cut the cost of production.

MORE WORKING POWER—Murphy Diesel is a heavy-duty engine, with working power to take the toughest conditions in stride. Four valves per cylinder give greater breathing capacity than conventional 2-valve design and permit higher power output. Cooler-running engine and almost unlimited valve life cut maintenance and operating costs.



These Murphy features are among the many big reasons why Murphy Diesels are gaining wider acceptance with contractors everywhere. In addition, you can select from a wide range of sizes in either full diesel (96 to 264 HP) or Dual-Fuel models (144 to 230 HP) with engine speeds of 1200 and 1400 rpm. "Packaged" Generating Units are available with capacities ranging from 64 to 165 KW. Ask about Murphy Mech-Elec Units for delivering electrical and mechanical power separately or simultaneously.

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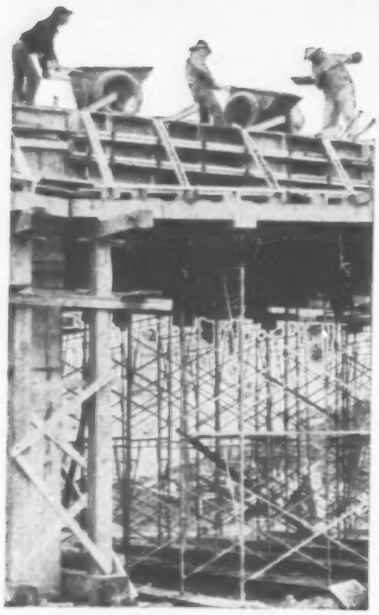
Bridge Forming



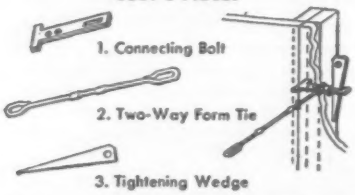
Symons Forms Cut 100 Days Off Bridge Forming Job

Ease of Erecting and Stripping Reduces Pouring Time

Contractor Lee Hoffman, Beaverton, Oregon, was given 320 days to pour 4,000 cubic yards of concrete for a bridge over Myrtle Creek in Oregon. Job was complete in 220 days or only ⅔ the time allotted.

Harry Pajutte, Chief Engineer for Hoffman, credits the ease of erecting and stripping Symons Standard High Strength Forms with contributing substantially to cutting pouring time, reducing number of men required on job, and providing greater mobility for the pouring equipment. Only

JUST 3 PIECES



3,144 square feet of panels were required for the 160,000 square feet of forming.

Symons Forms, Shores and Column Clamps can be rented with purchase option. Facts on Symons products and engineering service available upon request.

Symons

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Chicago 39, Illinois

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Those words "Digging Power Plus," are not just a catch phrase. They mean what they say! A Northwest Shovel *does* give you "Digging Power Plus."

The Northwest Crowd is a Dual Crowd. It is the simplest, most powerful crowding mechanism on the market today — a combination of the simple Northwest Independent Crowd *plus* an additional force for crowding that most independent crowd shovels waste.

Every power shovel on the market that dead-ends the hoist cable on the boom is wasting a force equal to one-half the pull at the dipper bale.

On Northwest Shovels the tension of the Hoist Cable is added to the force of the Independent Crowd Cable, making available for digging this additional force, wasted by most independent crowd shovels. *Here is a simple, powerful crowd!*

In this additional crowding force lies a large part of Northwest ability to handle rock digging without stuttering — without delay. It is one of the features that make it a *real* Rock Shovel and the standard by which rock shovel work is measured. It means more yards per hour in *any digging* — and that is money in your pocket.

Ask for more details on this proved, outstanding Northwest advantage. A Northwest man will be glad to fill in the details, or perhaps you'd like a catalog on the size machine you need.

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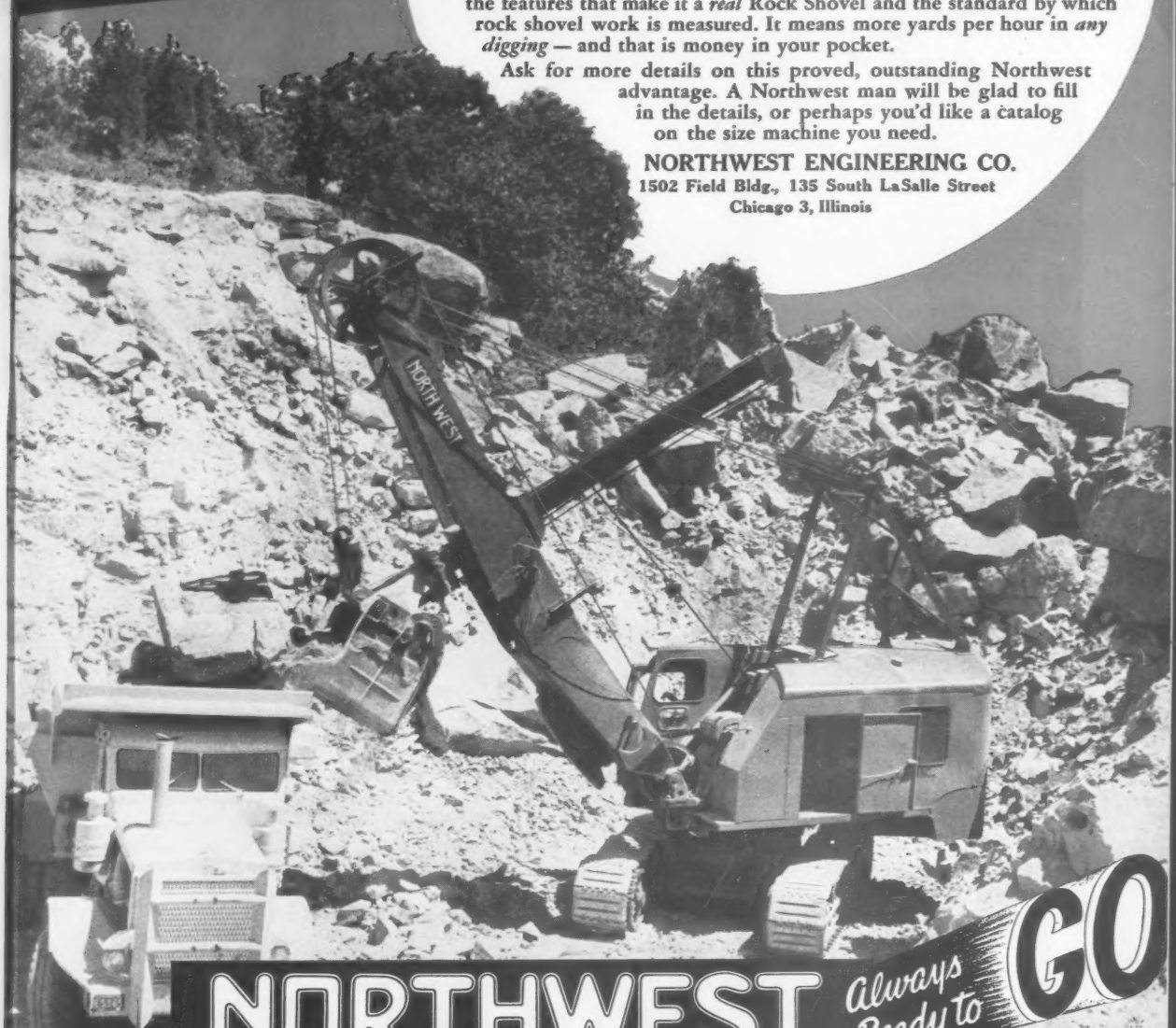

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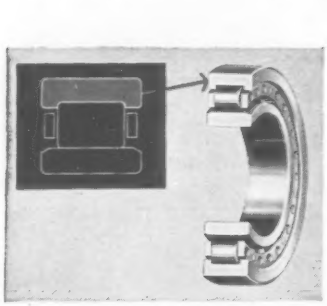
Loggers' "weight-lifter" tests bearing stamina!



TWO-LIP RACE INCREASES RIGIDITY

Two parallel shoulders made integral with the outer race, as shown in gray above, increase rigidity and durability —keep rollers in proper alignment. Precision-ground rollers and races give quieter, smoother operation.

Tossing around logs 6 feet in diameter like toothpicks is no job for a softie! This machine has to be *built* for it right from the start—*right down to the bearings.* And that goes, too, for the trucks which haul these back-breaking giants over the most rugged terrain. Bower tapered and straight roller bearings have been *engineered* for just such work as this—to last longer, perform better under any road or load condition. Painstaking quality control plus basic bearing design refinements—like those shown at left—have reduced Bower Bearing failure to a practical minimum. *Whatever* your product, if it uses bearings, specify Bower! There's a complete line of tapered, straight and journal roller bearings for every field of transportation and industry.

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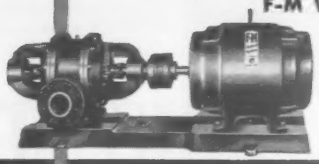
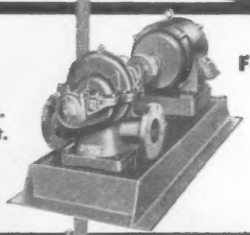
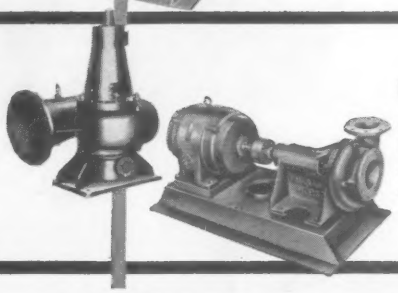
FEDERAL-MOGUL-BOWER BEARINGS, INC. • DETROIT 14, MICHIGAN

BOWER ROLLER BEARINGS

Guide to better pump selection

for		specify
boiler feed condensate return hot and cold liquids chemicals refrigerants, etc.	up to 200 gpm. pressures to 900 ft.	 **F-M WESTCO PERIPHERAL PUMPS** High pressure at normal operating speeds. Handle widely varying heads with little change in capacity. Sizes 1¼" through 2½".
hot and cold liquids liquid circulation nonviscous liquids boiler feed cooling towers, etc.	up to 900 gpm. pressures to 525 ft.	**F-M BUILTOGETHER CENTRIFUGAL PUMPS** General-purpose, close-coupled pump and motor units mount in any position—horizontal, vertical or angular. Sizes ¾" through 5".
sewage slurries paper stock fruit shrimp vegetables, etc.	up to 30,000 gpm. pressures to 175 ft.	**F-M NON-CLOG PUMPS** Unexcelled for clog-free handling of liquids with solids in suspension. Sizes 2" through 20". Vertical or horizontal. Bladeless or conventional.
water supply plant service booster circulating air conditioning refrigeration chemical liquids boiler feeds, etc.	up to 50,000 gpm. pressures to 700 ft.	 **F-M SPLIT-CASE CENTRIFUGAL PUMPS** High, sustained efficiency over wide range of conditions. Low-cost maintenance. Sizes 1½" through 36". Single stage or multistage.
hot and cold liquids chemicals circulating liquids nonviscous liquids cooling towers condenser circulation, etc.	up to 100,000 gpm. pressures to 250 ft.	 **F-M END-SUCTION PUMPS** A wide line of rugged, precision-built pumps. Sizes ¾" through 54". Horizontal or vertical centrifugal.

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"This truck has run over 7500 hours—and we've

OPEN PIT MINING SPECIALISTS, the Isbell firm relies exclusively on Texaco lubricants to keep 17 large dump trucks, 4 shovels, 2 'dozers and 2 rotary drills on the job.

TEXACO LUBRICATION ENGINEER R. H. Trimmer reviews lube problems with Supt. G. L. Laughton who credits Texaco Simplified Lubrication Plan with cutting maintenance costs and keeping big mining job on schedule.

never removed the pan"

"The Texaco Simplified Lubrication Plan keeps maintenance costs down, keeps the job on schedule," reports George L. Laughton, Supt. of Isbell Construction Company's Three Kids Mine project.

Isbell Construction Company is doing strip mining on contract with Manganese, Inc., Henderson, Nevada. They are using a Texaco Simplified Lubrication Plan for this project, and it is piling up some outstanding records.

"As of January 17, the truck shown in the picture had operated 7,714 hours using *Texaco Ursa Heavy Duty SAE 40* exclusively, and it's never had the pan removed," reports Superintendent George L. Laughton. "We also use *Texaco Crater 2X Fluid* for wire rope, *Texaco Gear Lube HD* for transmissions, *Texaco Marfak* and *Texaco Marfak Heavy Duty,* for chassis and wheel bearings. We are entirely satisfied with Texaco lubricants," says Mr. Laughton, "and we have never had a failure due to lubrication."

For *your* equipment, Isbell's outstanding success with Texaco lubricants proves two things: the quality of Texaco lubricants, and the advisability of getting Texaco to work out *your* Simplified Lubrication Plan. Because it is tailored specifically to each job's special needs, a Texaco Simplified Lubrication Plan enables you to handle all major lubrication with very few lubricants — as few as 6 in many cases. That keeps lubricant inventories low, and cuts down your chances of making lubrication mistakes. It also trims your maintenance expense. Above all, your equipment runs smoothly so your jobs can keep on schedule.

Ask a Texaco Lubrication Engineer to help you simplify your lubrication procedure with a Texaco Simplified Lubrication Plan. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

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Rosboro's fabrication crew has almost two decades of experience in engineered timber fabrication. The department is a unit of our mill at Springfield, Oregon, taking advantage of a large inventory, storage and shipping facilities. Rosboro can fabricate all types of solid sawn trusses and roof structures to meet your needs for modern engineering in wood.

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LUMBER COMPANY
SPRINGFIELD, OREGON

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State_____

Reader Comment

Misquote

SIR—We wish to call to your attention a paragraph appearing in "The High Cost of Moving Earthmovers" (ENR Nov. 14, p. 21).

The statement set forth in this paragraph is incorrect. This proceeding was an activity of the Associated Pennsylvania Constructors, in which the matter of the Central Pennsylvania Quarry Stripping and Construction Co. served as a test case. We won our case.

Perhaps the following excerpts from a release by our attorneys, prepared for the membership of APC will make the issues and the decision clearer:

"A significant victory for c tractors was achieved by Associated ennsylvania Constructors when the Lauphin County Court granted an injunction against the Secretary of Revenue and Director of the Bureau of Motor Vehicles enjoining the registration of oversize motor vehicles which are not constructed as required by the Vehicle Code. The Court further ordered the Secretary to issue special permits for oversize and overweight vehicles.

"The injunction proceeding was instituted in June, 1956, upon direction of APC after the Attorney General had ruled that The Vehicle Code required that all vehicles operating upon Pennsylvania highways be registered and specifically prohibited the operation of vehicles without registration plates. Thereafter, the Bureau of Motor Vehicles informed APC. that it would issue registration plates for oversize vehicles and at the same time restrict the use of the plates, for use with a special hauling permit only. This abrupt reversal in the long-standing interpretation of the Vehicle Code would have required contractors to spend thousands of dollars in obtaining registration plates.

"The court's opinion stated, in part:

"An examination of Article IX of the Vehicle Code discloses that this article constitutes a separate chapter of the code dealing with the one subject of 'size, weight and construction' and that the first section (901) of Article IX (75 P. S. 451) treats together vehicles exceed the sizes or weights or the construction requirements of the code, and that in Article IX on 'size, weight and construction' the only manner in which 'construction' is treated is by reference to the detailed definitions of sizes and weights, *there being no separate definitions or measures as to proper or improper construction* and that, therefore, when reference is made to vehicles 'constructed' as required by the act, such can only mean reference to vehicles within the size and weight limitations permitted by the act. This follows because to speak of any object's dimensions and weight is automatically to speak of its construction, and therefore specifications as to size and weight inescapably define and control the construction of a physical object.

"We think to require an annual registration of the plaintiff's vehicles in question would negative the reason for issuing a 'special permit' authorized by the code. Moreover, in construing this statute we have considered the practice which has prevailed in the Bureau of Motor Vehicles and State Highway Department for the past 25 years, during which no annual registration has been required of over-size and over-weight vehicles and the issuance of a special permit for the same and the payment of the fee therefore has been deemed a sufficient compliance with the law."

A. E. O'BRIEN
Executive Secretary
Associated Pennsylvania Constructors
Harrisburg, Pa.

Middle East Engineering

SIR—I want to say how much your article "Iraq's Operation Bootstrap" (ENR Dec. 12, 1957, p. 34) was enjoyed. The comprehensive coverage together with the clarity of presentation leaves me with the impression that I have a much better appreciation of the problems and objectives of some of the Near East countries.

Let's have more articles of this general nature, which cover the political and social implications as well as the engineering planning for development of large areas.

R. W. SAUER
Vicksburg, Miss.

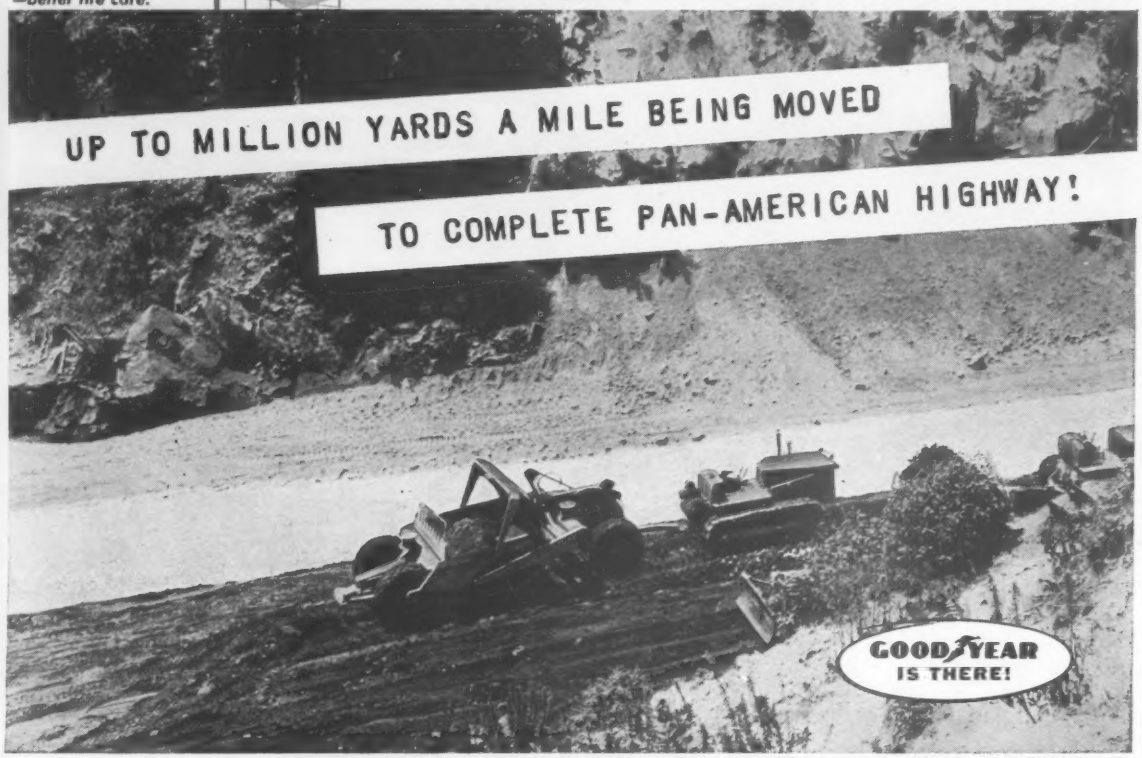
•

SIR — Your excellent article, "Little Country with Big Construction," (ENR Nov. 21, 1957, p. 28) was of special interest to me since I had charge of the investigations, studies and design of the initial Litani River Project as

Engineering News-Record welcomes expression of opinions from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance. Letters should be addressed Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

Look for this nearby Goodyear dealer sign for better tire values —better tire care.

In the mountains of Guatemala, the last links are being forged in the 3,179-mile right-of-way from Texas to Panama. Landslides (as shown below) are the order of the day—but early in '58, the first wave of American tourists is due to swap dollars for blankets, bananas and local color! Two ten-hour shifts push the work forward, and Goodyear tires—Hard Rock Lug, Sure-Grip Lug and All-Weather Earthmover—help keep the job rolling, faster, surer and at lowest cost-per-mile.



Watch "Goodyear Theater" on TV—every other Monday 9:30 P.M., E.S.T.

Tires move more yards for less

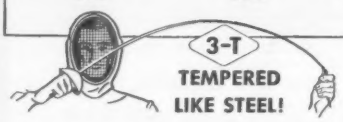
when built with **Triple-Tough 3-T Nylon Cord!**

ALL 3-T NYLON CORD—*Tubeless or Tube-Type*

HARD ROCK LUG

SURE-GRIP LUG

ALL-WEATHER EARTHMOVER



Like steel, tire cord must be *tempered* to be tough. Goodyear's exclusive 3-T process, involving Tension, Temperature and Time, *triple-tempers* cord to make it TRIPLE-TOUGH—to give you longer tire life, lower cost-per-mile.

Known as *"the greatest tire SAVER in 23 years,"* Triple-Tough 3-T Nylon Cord is a Goodyear exclusive.

During years of use, on the toughest jobs on earth, Goodyear 3-T Nylon Cord tires have literally saved *millions* for contractors and truckers who realize that the final cost of any tire depends entirely on *what they get out of it.*

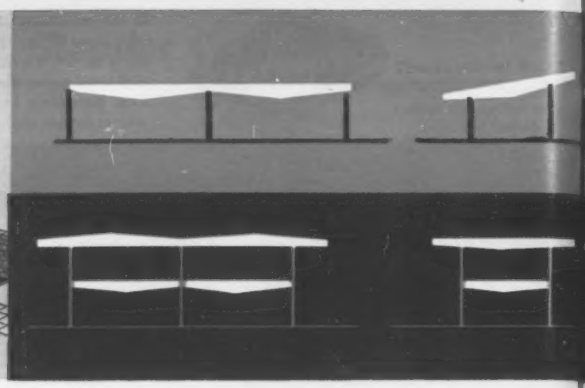
The fact that more tons are hauled on Goodyear tires than on any other kind, certainly suggests that most operators get more yards-per-dollar, more miles-per-dollar, on Goodyears. If *you're* not already using Goodyear 3-T Nylon tires on your equipment, try them! Goodyear, Truck Tire Dept., Akron 16, Ohio.

Buy and Specify

GOODYEAR

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

All-Weather, Sure-Grip—T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio



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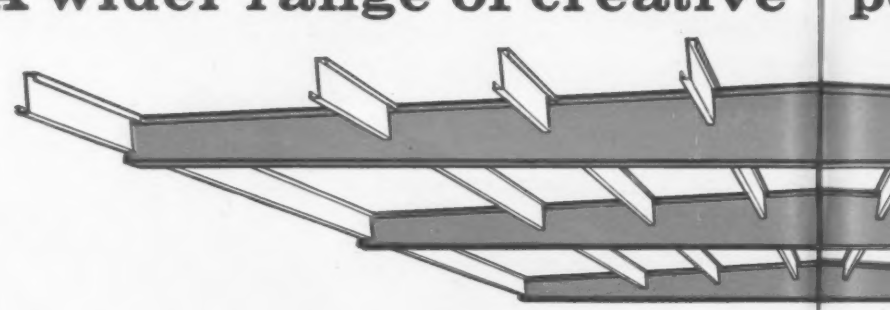

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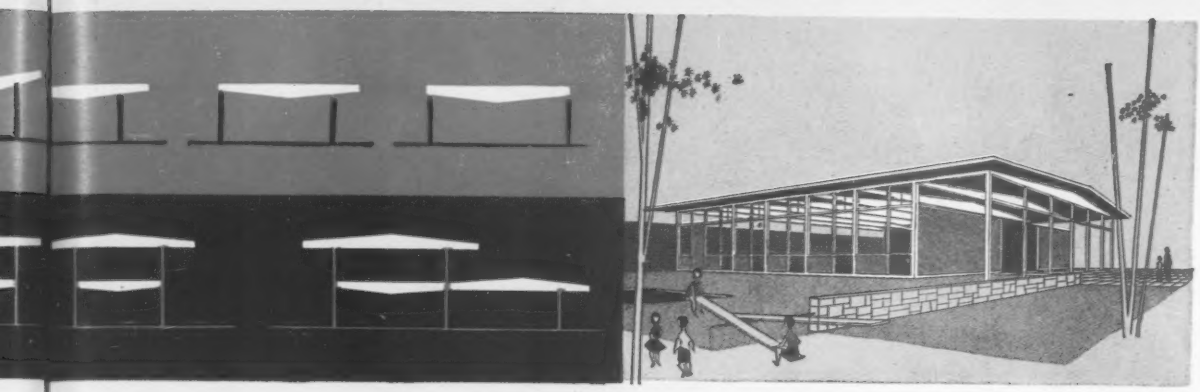

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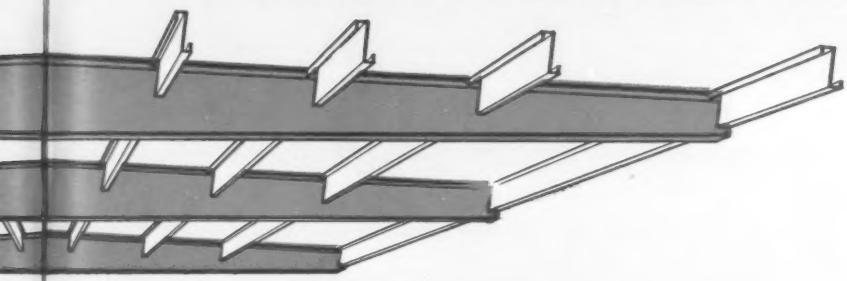

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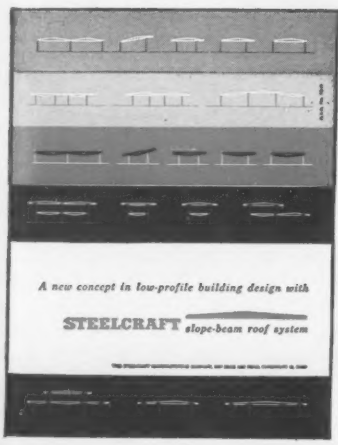

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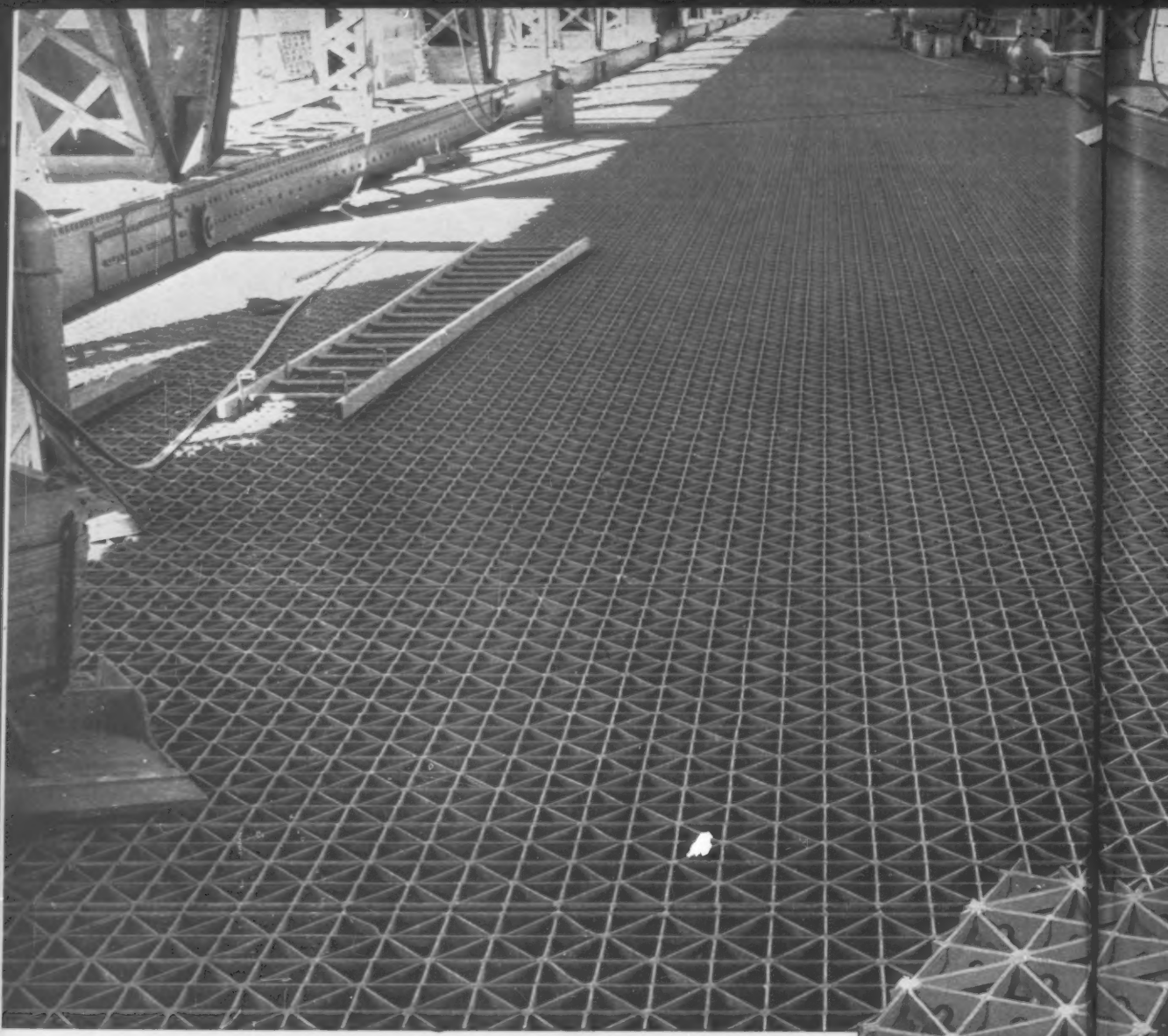
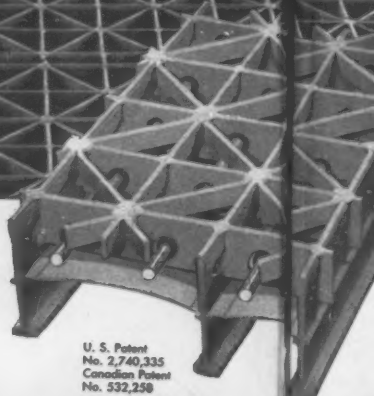


STRONG, RIGID and TRUE *Beneath the Concrete:*

GREULICH 4-WAY GRID

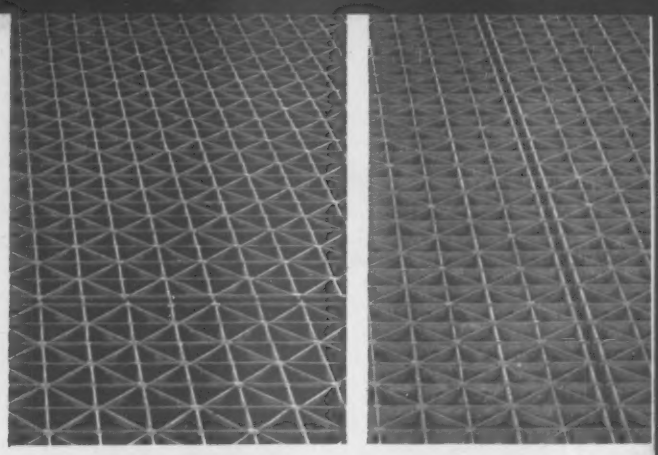


U. S. Patent No. 2,740,335
Canadian Patent No. 532,258

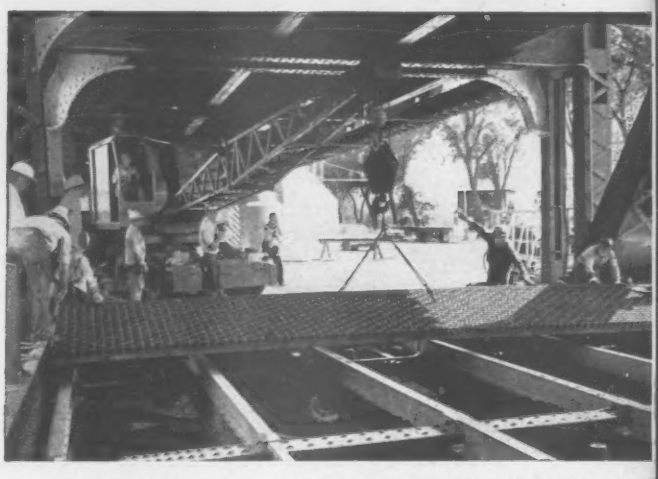
From now on motorists who travel along the lower deck of the famous Rock Island bridge will find a smooth, flat ribbon of concrete stretching across the Mississippi from Rock Island, Illinois to Davenport, Iowa. Beneath the concrete—providing a flat, single-plane surface and the strength and rigidity—lie the roadwidth units of Kerrigan open steel bridge flooring used by F. K. Ketler Company, contractors, in the modernization of the double-deck bridge. Modjeski and Masters were designing and consulting engineers to the U. S. Army Corps of Engineers and the Chicago, Rock Island & Pacific R. R.

Kerrigan open steel bridge flooring in the new Greulich 4-way grid design is precision manufactured in 5-inch deep units with integrally connected triangles. Bearing members are spaced 7½ inches apart (cutting field welds by 20%). Roadwidth units (in lengths up to 42 feet) are fabricated in 7-foot, 3-inch panel widths—a size which cuts handling costs to a minimum but still permits hauling on ordinary flat-bed trucks. Maximum rigidity keeps units true during shipping, handling and erection; and assures true alignment. Test data is available.

General Sales Office, 274 Madison Avenue, New York, New York



Note true alignment of panels running in both directions in above photographs. This same alignment can be duplicated mile after mile since flooring is manufactured in precision jigs.



Economical field erection was clearly demonstrated in the modernization of the famous double-deck Rock Island Bridge. Roadwidth panels of Kerrigan's GREULICH 4-WAY GRID were swung into place to form a flat, single-plane roadway. Installation by Whiting-Turner Corp., Baltimore.

Then the heavy transit mixers were driven on to the roadway, and the grid, complete with built-in forms (resting on carrying ribs rolled into the beams) and reinforcing rods, was then filled half depth with concrete to specifications drawn by Modjeski and Masters, Harrisburg, Pa., consulting engineers.

- **Stronger**
- **Quieter**
- **20% Fewer Welds**

For additional information, test data and list of bridges in Ga., La., Fla., Mass., Ill., Md., Minn., and Penn., which you can inspect, write Harvey F. Neel, Gen'l. Mgr., Div. G-8, Kerrigan Iron Works, Inc., Nashville, Tenn.

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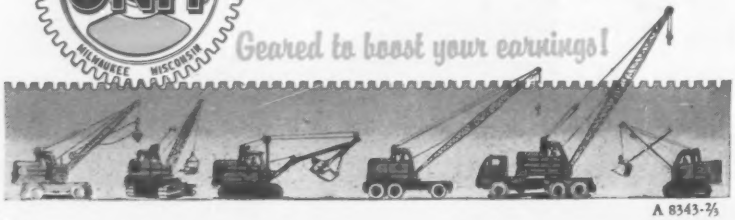

A 8343-7½

described in ENR Sept. 29, 1955.

I would naturally be sensitive to any remarks of favorable aspect to a revised plan for development of the Litani, and therefore am impelled to comment on reasons enumerated for the change, particularly the one which states "considerably more power can be developed."

After all, there is only so much water and the same total fall to the sea either by way of the main stem of the Litani or by a tunnel through the mountains. Hence, there can be little difference, if any, in the total power (kilowatts) developed. The seasonal flow of the Litani River is highly variable and hence requires regulation to obtain the maximum benefits. With the elimination of two reservoirs considered necessary for regulating purposes and the storage they would afford, it is inconceivable that the new plan can provide as much firm energy (kilowatt-hours), which is so essential to the economic success of the project.

No doubt political considerations were largely the inspiration for the present scheme. The neighbors on the south have long had plans involving development and use of the Litani River water.

ROBERT F. HERDMAN
Seattle, Wash.

CALENDAR

National Association of Home Builders, annual meeting, Conrad Hilton Hotel, Chicago, Ill., Jan. 19-24.

American Road Builders Association, annual meeting, Sheraton-Park Hotel, Washington, D. C., Jan. 20-23.

Canadian Construction Association, 40th annual meeting, Chateau Frontenac, Quebec City, Quebec, Jan. 26-29.

Associated Equipment Distributors, annual meeting, Conrad Hilton Hotel, Chicago, Ill., Jan. 26-30.

American Society of Heating and Air-Conditioning Engineers, annual meeting, Penn-Sheraton Hotel, Pittsburgh, Pa., Jan. 27-29.

National Conference on Construction Operations, 3rd annual meeting, University of California, Los Angeles, Jan 31-Feb. 1.

Associated General Contractors, 39th annual meeting, Dallas, Tex., Feb. 10-13.

National Society of Professional Engineers, spring meeting, Michigan State University, East Lansing, Mich., Feb. 13-15, 1958.

Association of Asphalt Paving Technologists, Sheraton-Mt. Royal Hotel, Montreal, Canada, Feb. 17-19.

National Council for Stream Improvement (of the pulp, paper and paperboard industries), annual meeting, the Waldorf-Astoria, New York, N. Y., Feb. 17-20.

American Concrete Institute, annual convention, Morrison Hotel, Chicago, Ill., Feb 24-27.

American Society of Civil Engineers, Chicago convention, Hotel Sherman, Chicago, Ill., Feb. 24-28.

Working on the distribution system for the Trans-Canada natural gas pipeline, this new Barber-Greene Model 774 Ditcher cuts through clay frozen to a depth of five feet at temperatures around 26° below zero.

New ditcher wheels through frozen clay at 26° below zero

Working every day for two sub-zero months, this new Barber-Greene Model 774 wheel-type ditcher was subjected to operating conditions far beyond any likely to be encountered in normal use. It cut through clay frozen to a depth of five feet in temperatures as low as 26° below zero. Only four days during the entire period did the mercury rise above zero.

Operated by G. M. Gest Construction Ltd., Montreal, the new ditcher was put through this grueling test in Manitoba on a vital phase of the Trans-Canada natural gas pipeline distribution system.

Digging 22 inches wide and four feet deep, the Model 774 averaged over three feet per minute in these extreme conditions.

This ditcher is completely new:

- New digging-wheel drive through telescoping shaft, floating differential, and split No. 1 shaft
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- New electric overload protection
- New all-hydraulic spoil conveyor
- New hydraulic controls for easier, more accurate operation

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ENGINEERING NEWS-RECORD

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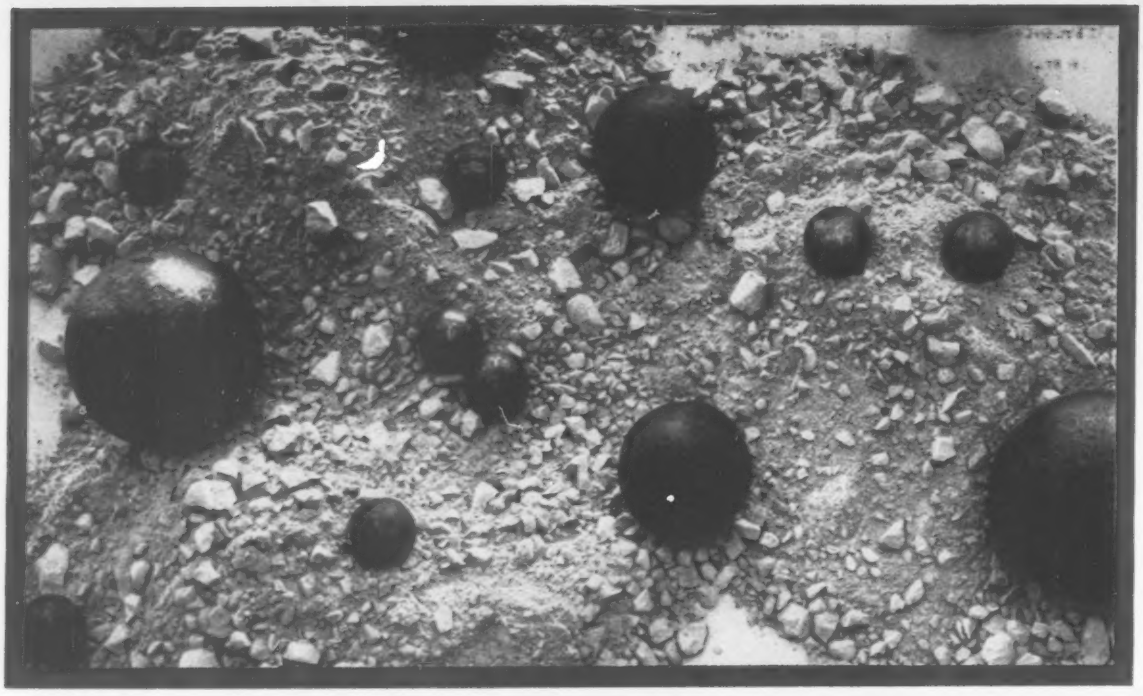
THE CONSTRUCTION WEEK

NEW BRIDGE FOR PEACE RIVER—A board of four engineers has been appointed by the Canadian government to study the design of a new Alcan Highway bridge over the Peace River. The original bridge collapsed October 16 of last year (ENR Oct. 24, 1957, p. 26) when its north anchorage block slid forward on its shale base. Defense Construction, Ltd, a Crown company, will call for construction bids at a date not yet set.

ENGINEERS CAN'T DESIGN BUILDINGS?—The legality of a Denver, Colo. city ordinance, requiring that plans for all public and semi-public building must bear the seal and signature of a state licensed architect, recently was upheld by the U. S. Tenth District Court of Appeals. A Denver resident—a graduate engineer but not a licensed architect—has been vainly contesting the ordinance since 1953 as "an arbitrary and unlawful" interference with the practice of his profession. Exhausting recourse to state courts, he carried his fight to the federal court, which also held that the law was within the police powers of the city.

SAUCE FOR THE GANDER—The scattered announcements that industrial and expansion projects already under way have been halted may not be as ominous as they appear at first glance. A top officer of the National Constructors Association replied "no" when asked if he foresaw a strong trend toward the stopping of going jobs (see p. 108). He said that although the declining economy and oversupply were given as reasons for such moves, he knew of cases where more subtle factors influenced the decision—"an internal labor relations problem, and not deep gloom with respect to the long-term economic outlook." He reported that some companies were having difficulty explaining the layoff of great numbers of their own workers while at the same time keeping construction workers employed 40 or more hours a week on an expansion project.

NIAGARA AWARD—Merritt-Chapman & Scott Corp., New York, on Monday was awarded the contract for the Lewiston powerhouse of the Niagara Power Project based on its low bid of $98.3 million submitted Jan. 9 (ENR Jan. 16, p. 27). The Power Authority of the State of New York's big undertaking still awaits a construction license from the Federal Power Commission.



How Penn-Dixie Converts the Raw Materials into a Smooth Liquid Form

Shown above is the blended mixture of limestone, shale, iron ore, sand and samples of steel grinding balls. The blended mixture, with water added, is fed into huge revolving cylinders containing thousands of these tumbling steel balls. These balls, ranging in size from three and a half inches to one inch, crush and grind the material into a smooth, fine-grained consistency. This process is called "pulverization".

This smooth, creamy mixture called "slurry" is then pumped to storage tanks where it is carefully mixed and blended. From there it is pumped into kiln feed basins where constant agitation keeps the materials in suspension awaiting the next step—the burning process.

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WASHINGTON OBSERVER

- **Construction again a pump-primer**
- **More mortgage money to boost housing**
- **Fed's tight money critized**
- **Tax cut talk growing more lively**

● **Construction as a pump-primer is counted on heavily in the Administration's plans for making the present recession mild and brief.** This shows in the President's Economic Report to Congress this week, prepared for him by his Council of Economic Advisers.

Immediately, the council is counting on a housing pickup and the increase in defense spending to give business a lift. Council members privately say they expect the upturn should come in the second or third quarter of the year—probably the third.

Over the long run, the council is equally confident. It thinks that government spending for defense and public works, continued population growth, and the results of industry research will contribute to a vigorous business expansion "that can be sustained."

—

● **Improved mortgage financing is one of the Administration's biggest reasons for optimism about the outlook for the months ahead.** Officials believe it will be powerful enough to spark a substantial rise in housing. Experts are cheered by a narrowing of the margin between mortgage interest rates and returns on other kinds of investment.

Besides housing, construction of private institutions is expected to keep rising. Higher outlays for roads and public buildings are also cited. The Administration has no special plans for stimulating this kind of construction on the grounds that plans now in the works are sufficient to give the economy a solid thrust forward.

—

● **The President's report has an implied criticism of the Federal Reserve Board's handling of the tight money policy.** The report pinpoints the beginning of the recession during last summer—and then notes that the board did not move toward easing money until October.

Privately, Administration economists are unhappy over the tightness of credit today. They think the Federal Reserve should be using more of its authority right now to force interest rates downward.

—

● **Congress it taking a dim view of the Administration's rosy outlook for 1958 business trends.** Democrats on the Joint Economic Committee will accuse the Administration of having only hopes on which to base the prediction of an upturn, but no convincing evidence.

A tax cut later in the year is getting more lively consideration in Congress as a result of the concern over business. Key lawmakers—including Congressman Wilbur Mills of Arkansas, new chairman of the House Ways and Means Committee which must originate all tax legislation—are keeping in close touch with every business indicator as it comes out. Congressman Mills plans to take a look at the situation no later than May, and if things aren't beginning to look up, then the push for a tax cut will gain momentum —if it doesn't before then.

Concrete Wings Over Idlewild!

'INCOR' CONCRETE CANTILEVER ROOFS PROVIDE VAST FIRE-SAFE HANGAR SPACE FOR PAN AM AND TWA

• At New York's bustling, burgeoning International Airport — Idlewild — two remarkable new hangars stand side-by-side. They were built for Pan American World Airways and Trans World Airlines by two internationally prominent construction firms, using different forming methods.

Both hangars feature lightweight concrete cantilevered roofs 4½-in. thick, suspended by cables from anchor walls that span the central core structure. Wing-tip to wing-tip the hangar shown is 360-ft. wide; its mate is 412-ft. wide. Beneath these "wings" extends vast unobstructed hangar space where several giant airliners can be serviced simultaneously on both sides of the hangars. Over 30,000 bbls. of 'Incor'*—America's first high early strength portland cement—and 45,000 bbls. of Lone Star Cement were used in the structures.

*Reg. U.S. Pat. Off.

UNDER A WING. Each cantilevered section spans a vast area. Doors will ride on rails, far left. Piping is for radiant heating. Sunlit gaps across shadow indicate roof slab joints still ungrouted.

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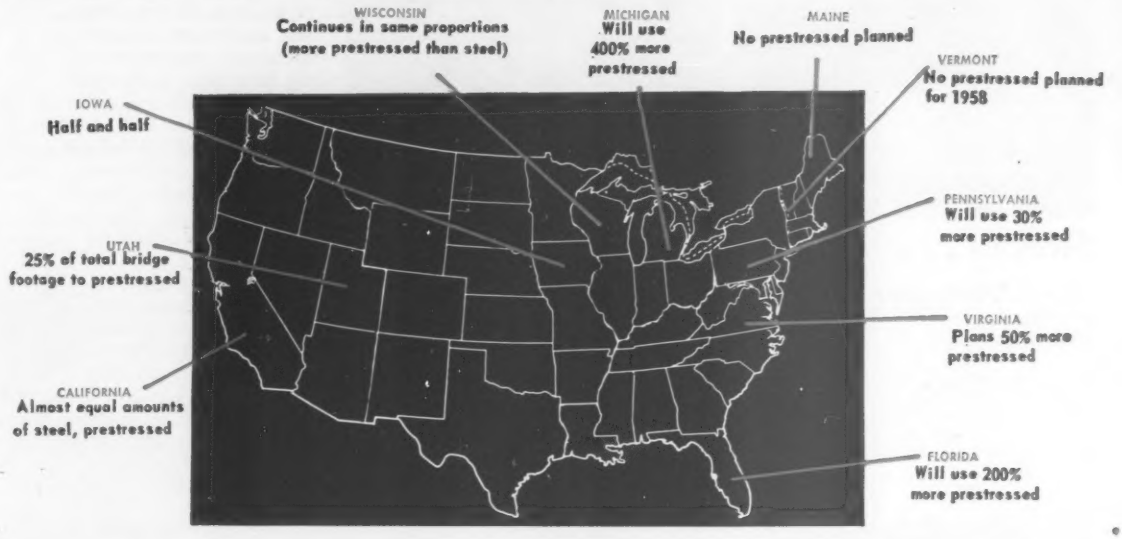
Steel vs Prestressed Concrete for Highways

States report on how steel and prestressed concrete share their bridge market. Some note sizeable growth of prestressed over past year.



Prestressed Pares Steel's Bridge Market

Based on the all-important factor of availability, there is no question that the use of prestressed concrete members for highway bridges is making increasingly serious inroads into what has been—until very recently—an exclusive preserve of steel.

A survey of the state highway departments indicates that—with very few exceptions—every state is making increasing use of prestressing techniques in the rush to get its highway program into construction. And in almost every case the overpowering reason is that the prestressed members are quickly available. In only four cases did the highway engineers cite cost as a major consideration.

And the use of the concrete members is not restricted to small structures. Range of span lengths, which the states indicated they would use, or are using, was between 62 ft and 105 ft (in California), with the average running between 75 and 95 ft.

• **Measuring stick**—In order to arrive at the fairest possible basis for comparison, ENR's editors chose to ask the highway engineers for figures on square feet of bridges built in steel and in prestressed during the years 1956 and 1957, and for plans for 1958. Additionally, the states were asked for the length of spans they would approve and the reasons for using prestressed members—if indications showed an increase in this use.

The results are startling in terms of percentages. Even where they do not show substantial decreases in steel used, they indicate a steadily increasing "bite" into the market for bridge members.

• **Results**—Among the states reporting little or no prestressed work for the 1956-57 period were Arkansas, Maine, New Hampshire, and Vermont. Significantly, Vermont's highway department noted that not enough commercial casting beds were available in the area to provide a competitive situation. Arkansas, while it reported no prestressed work for the two years, said it planned to do some in 1958.

A representative state-by-state rundown of the survey looked this way:

• **California**—1956 used 174,200 sq ft of prestressed to 1,532,000 ft of steel; in 1957 used 607,600 sq ft prestressed to 1,205,400 sq ft of steel. In 1958, plans an increase of 400,000 sq ft in use of prestressed.

• **Connecticut**—1956, 95,000 sq ft prestressed, 3,450,000 steel; 1957, 110,000 sq ft prestressed, 2,500,000 steel. 1958, 50,000 sq ft prestressed, 750,000 sq ft steel.

• **Florida**—1956, 650,000 prestressed, 309,000 steel; 1957, 1,980,000 prestressed, 390,000 steel. 1958, plans a 200% increase in prestressed.

• **Iowa**—1957, 266,000 prestressed, 118,000 steel. 1958, slight decrease in use of prestressed.

• **Michigan**—1956, 43,000 prestressed, 956,000 steel; 1957, 60,000 prestressed, 862,000 steel. 1958, plans a 400% increase in use of prestressed.

• **Montana**—1956, no prestressed, 120,000 steel; 1957, 96,000 prestressed, 112,000 steel. 1958, plans about same proportion.

• **New Mexico**—1956, no prestressed, 9,635 steel; 1957, 32,172 prestressed, 21,859 steel. 1958, plans to use prestressed on 50% of work.

• **North Carolina**—1956, 35,590 prestressed, 347,793 steel; 1957, 293,443 prestressed, 668,814 steel. 1958, about the same.

• **North Dakota**—1957, 48,000 prestressed, 145,000 steel. 1958, use 100% more prestressed.

• **Virginia**—1956, 25,000 prestressed, 80,000 steel; 1957, 72,000 prestressed, 250,000 steel. 1958, use 50% more prestressed.

• **Wisconsin**—1956, 61,070 pre-

Steel vs . . .

Prestressed Concrete

stressed, 194,000 steel; 1957, 223,210 prestressed, 185,730. 1958, about the same proportion.

• **Lengths**—Most of the states indicated they intended to make further use of the new material and would approve considerable span lengths for structures of prestressed members.

Most conservative states reporting were Montana, which now uses spans up to 60 ft in length, and Delaware, with lengths up to 45 ft. California, on the other end of the scale, will approve spans up to 105 ft long. Arkansas, Idaho and Virginia will use spans of 100 ft length; Florida up to 98 ft, and the others range downward.

West Virginia, however, said it would use prestressed only for "short spans," but did not specify lengths.

• **Reasons**—Only a few states had had enough experience with prestressing to give comparative costs in inswer to one question on ENR's query.

Two of these were Iowa and North Dakota, both of which reported that prestressed members were between $2 and $3 lower (per square foot in place), than steel.

But the overwhelming majority of the highway engineers placed availability of the members—in sizes and shapes and time—as the major factor in their choice of prestressed.

Behind this reason, in order of mention, came appearance and lower maintenance costs.

• **Comments**—Some of the comments included on the questionnaire by state officials were illuminating.

Said New Mexico: "Virtual curtailment of wide-flange shapes for bridge construction during the past few years has stimulated local industries to establish pretensioning beds to take care of our needs."

Said Ohio (which used only 5,000 sq ft of prestressed in 1957, to 2,300,000 sq ft of steel, but plans a slight increase in prestressed for 1958): "Low-strength concrete and disintegration are not conducive to use of prestress, from the state highway view. However, some of our counties are using precast, prestressed units."

Said Michigan: "Over half of the 1958 projects where use of prestressed concrete is contemplated will be I-beam prestressed members, designed to give composite action with cast-in-place floor slab."

Said Utah (which used no prestress in 1956 or 1957, but in 1958 plans to use it for 25% of its work): "Casting beds now available locally."

Said Montana: "We are planning to develop our own prestress standards."

Duba Named to High City Post in Chicago

John G. Duba was appointed administrative officer to Chicago's Mayor Richard J. Daley last month. For the last four years he has been administrative engineering assistant to the city's Commissioner of Public Works, George L. DeMent.

In his new position, which pays $21,000 a year, the 36-year-old civil engineer will supervise administrative management of city departments, boards and commissions, and coordinate their activities.

Mr. Duba received a BSCE degree from Washington University, St. Louis, in 1947 and a master's in civil engineering from the University of Missouri School of Mines and Metallurgy in 1949, where he taught engineering from 1947 to 1949. From 1949 until joining the Chicago Department of Public Works in 1953, he was a civil engineering instructor at Illinois Institute of Technology.

Spending Cut

Major projects affected as Corps must cut spending through June 30

There was much uncertainty this week among contractors doing or expecting business from the Army Corps of Engineers due to a freeze order that has now been turned into a lower spending ceiling for the fiscal year ending June 30.

It apparently means a cut of $65 million from planned expenditures between now and July by postponing contract awards and slowing down some existing contracts. However, spending will pick up after July 1 as the Corps' fiscal 1959 construction spending has been budgeted at $34.8 million above this year's original level.

The chronology of events stemming from President Eisenhower's reassessment of government programs following the military advances of the Soviets with the Sputniks goes about like this:

Congress provided more than $700 million for the Corps in the appropriations bill last spring.

The Bureau of the Budget allocated $696 million for spending, spending for all purposes, not just construction.

In November, the Budget Bureau put a spending ceiling of $630 million on the Corps.

In December, the Budget Bureau and the Corps agreed there would be a freeze on new advertising or award of contracts pending a review.

Late in December, the freeze was lifted, but the 10 division offices of the Corps were given a spending ceiling for the rest of the fiscal year based on the overall $630 million ceiling. Under this, the district engineers can award contracts, but, judging from reports received from all over the country, district engineers are holding off while programs are being re-examined in the light of the new budgetary considerations.

The reduced spending order was not meant to slow down contracts in force, but the St. Louis District Engineer stated, ". . . Planned cash expenditures may have to be reduced on some work now under contract."

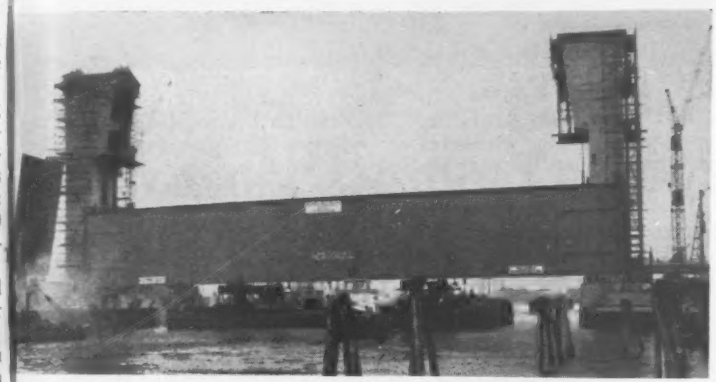
Among contract awards or bid openings reported to ENR as being postponed were those scheduled for Oahe Dam on the Missouri River in South Dakota; Sacramento, Calif., ship canal; Los Angeles flood-control structures; Mississippi River channel dredging; Baton Rouge harbor in Louisiana, and Barkley Dam on the Cumberland River in Kentucky.

The Corps in Washington feels that once the last half of this year is over, its program will go ahead smoothly.

Engineering News-Pictures

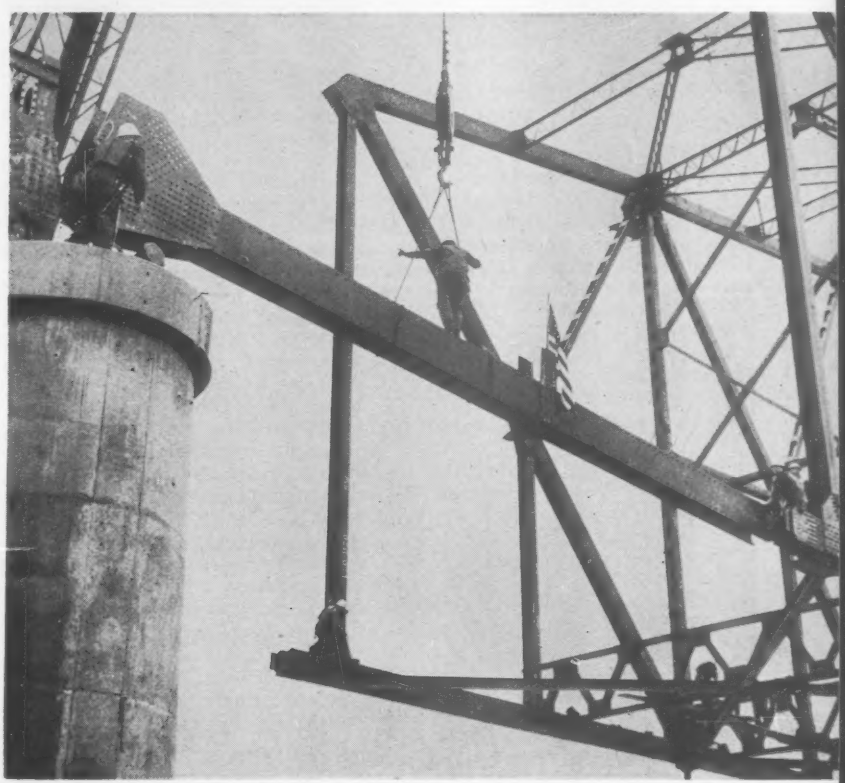
Here Is a Different Looking Garage

When New Orleans' Montelcone Hotel decided to build a 300 car, five-level parking garage in the city's old French Quarters, it was given a permit on the condition that the building would conform architecturally with its surroundings. The result is shown at right. Behind the "century old" facade of the new structure are street-level shops and car lifts. Wrought iron balconies similar to that in the left foreground also will be added.



Dutch Build 240 Foot Flood Gate

Tugs are shown inserting a 240 ft long steel gate between 120 ft high towers on the Hollandse Yssel River near Rotterdam, Holland. The door normally will be in a raised position to permit shipping in the busy waterway. It will be lowered when flood tides become dangerous. To cost $8 million, the gate is part of a mammoth Dutch flood-control program (ENR Dec. 20, 1956, p. 42).



Last Gap Closed on Columbia River Span

Closing of the last gap of the new span between Portland, Ore., and Vancouver, Wash., marks the near completion of the second bridging of the Columbia River to parallel the existing Interstate Bridge. When opened to traffic in June 1958, the old bridge will be renovated and brought up to federal standards. Judson-Pacific-Murphy subcontracted for erection of the steel work from Guy F. Atkinson Co., which held the prime $6.68 million contract for the bridge construction.

Lease-Purchase Gets Financial Support

GSA accepts financing bids on six projects to cost $16.2 million; building bids to be opened this month

Private money came out in strength last week to bid on the financing of lease-purchase projects. Government officials see the big financing breakthrough as a sign that the long-stalled construction program is on its way.

After three days of successful bid openings, Washington optimism hit a new high.

Low bids of 4.67% to 4.84% were accepted by the General Services Administration for financing six projects estimated to cost $16.2 million.

If hopes are realized, scores of buildings will go out for construction bids this year. Two encouraging facts stood out at the close of last week's bidding. One is the willingness of the government to accept higher interest rates—if they are competitive—edging up toward 5% for borrowing to finance the jobs. As a counter-recession stimulant, in a money market that is still sticky, the Administration does not balk at rates considerably higher than the old 4% ceiling, provided there is sufficient competition in the bidding to demonstrate that the low offer is reasonable.

Appearance of strong competition was the second encouraging factor in last week's bidding. Three to six substantial bidders—life insurance companies and banks—competed for the six projects that drew acceptable bids.

• **Last week's openings**—Last week, General Services accepted bid openings on these lenders for the following:

Kansas City Life Insurance Co., Kansas City, Mo.—Abingdon, Va., post office and federal courthouse, $580,000, at 4.78% interest; Biloxi, Miss., post office and courthouse, $1,070,000, at 4.78%; Gainesville, Tex., post office, $620,000, at 4.74%.

Bankers Life Co., Des Moines, Ia.—Green Bay, Wis., post office, $1,550,000 at 4.84%; Omaha, Nebr., post office and courthouse, $9,130,000 at 4.67%.

New England Mutual Life Insurance Co. of Boston, Mass.—Huntington, W. Va., federal building, $3,250,000, at 4.778%.

Acceptance of a financing offer, of course, is not in itself enough to start construction of a building. This stage requires a second step—getting a bid from a construction contractor to erect the designed structure within the limits of the money available.

GSA is highly optimistic on this score, too. The initial test comes this week, when the agency's regional offices begin opening construction bids for five projects that produced acceptable financing offers last month (ENR Dec. 26, 1957 p. 19). Field offices started opening construction tenders for these building jobs on separate dates beginning yesterday—with others to be opened through February 18.

• **Money market improved**—As an indication of the change in the money market in the last 30 days—at least for financing of lease-purchase projects—buildings that failed to get acceptable bids then are getting them now. Bidders were accepted last week for four projects that elicited no satisfactory financing response in the December openings—the first round following the lifting of the old ceiling.

Interest rates, too, have shown marked improvement between the two rounds of openings. In December, the financing bids that GSA accepted ranged from 4.74% to 5%, considerably above last week's 4.67% to 4.84%.

With the five projects readvertised from December, GSA is taking bids on a total of thirteen in the current round. To finance all of them, including six scheduled for this week and next, requires up to $22.8 million, of which $16.2 million was assured last week.

• **GSA moves fast**—In the light of last week's success, GSA lost no time in inviting financing bids for 12 additional projects, plus the one on which bids were rejected. These newly advertised projects call for a total maximum investment of $7.2 million. Bids will be opened in Washington on four days, February 25 to 28 inclusive.

GSA also is moving quickly to advertise for construction bids on all projects that obtain financing commitments in the current round. At the weekend, agency officials announced that they would promptly invite contractors to bid on the six projects underwritten by financing proposals accepted last week.

Fast action on construction bids is imperative. Until GSA gets an acceptable construction tender for a project, it cannot close the financing contract. The agreement with the investor bidder stipulates that this closing must take place within 90 days after the opening of financial bids.

Actually, of course, GSA is set up for this kind of quick operation before it invites financing offers on a project. Plans and specifications are complete and ready in the regional office for release to interested construction bidders.

There has been some question that construction contractors would be able to build lease-purchase projects on the basis of cost estimates made a year or two ago.

These cost estimates were approved by the Budget Bureau and Congressional committees in giving the green light to the financing and construction of the projects. The comptroller general has given an opinion that the agency does not have to be rigidly bound by these approved figures and that increases in construction costs since then might be allowed for.

• **Six significant projects**—Here are the first six projects that will give an answer to this question, with the opening dates for construction bids:

- January 22, Albuquerque, N. M., federal office building, maximum investment of $5,800,000.
- January 28, Council Bluffs, Iowa, post office and courthouse, $1,690,000.
- January 31, Kansas City, Kan., post office and courthouse, $2,100,000.
- February 14, Burlington, Iowa, post office, $1,180,000.
- February 18, Atlanta, Ga., communicable disease center, $11,500,000.

GSA's present round of financial bid openings is continuing this week.

• **February bids scheduled**—The projects scheduled for financial bidding in February are listed below by date of bid opening with financing required:

February 25

Mt. Hope, W. Va., Bureau of Mines building, $600,000.

Camden, Ala., post office, $270,000.

Redwood Falls, Minn., post office, $430,000.

Lake Charles, La., post office and courthouse, $1,870,000.

February 26

Daingerfield, Tex., post office, $220,000.

Sedan, Kans., post office, $200,000.

Greenville, Miss., post office and courthouse, $1,120,000.

February 27

Jonesboro, La., post office, $370,000.

Laurel, Miss., post office, $770,000.

Lafayette, Tenn., post office, $270,000.

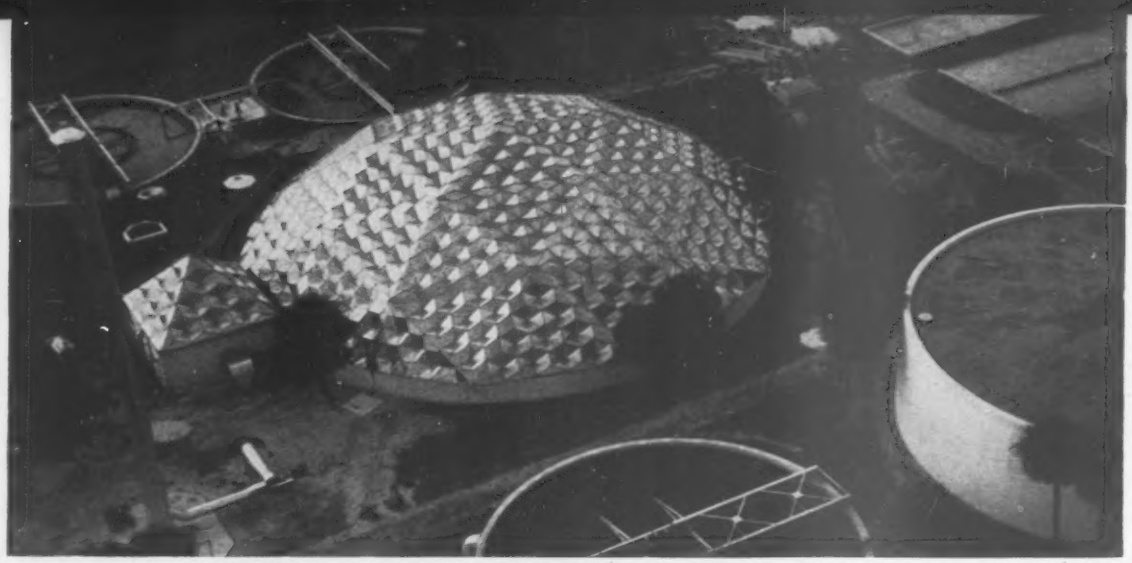
February 28

Ronceverte, W. Va., post office, $240,000.

Manning, S. C., post office, $480,000.

Sisseton, S. Dak., post office, $340,000.

All the investments offered for February bidding are repayable in 10 years.



ALUMINUM SPACE FRAME with a skin made up of hexagonal panels covers the trickling filter at Sarasota, Fla., sewage plant. Membrane hung below the pipe frame traps rising fumes that are released through 100 ft stack at left.

Low-Cost Dome Traps Sewage Odors

In a move to control odors at its sewage treatment plant, the City of Sarasota, Fla., has covered the trickling filter with a dome-shaped, lightweight space frame.

The dome, over the tricking filter, is 112 ft in diameter with a 27 ft rise. It encloses a filter area of 10,000 sq ft.

Fumes and gases rising from the filter beds are trapped by a water-proofed lining hung below the pipe frame. The fumes are drawn back through the filter and released through a 100 ft stack.

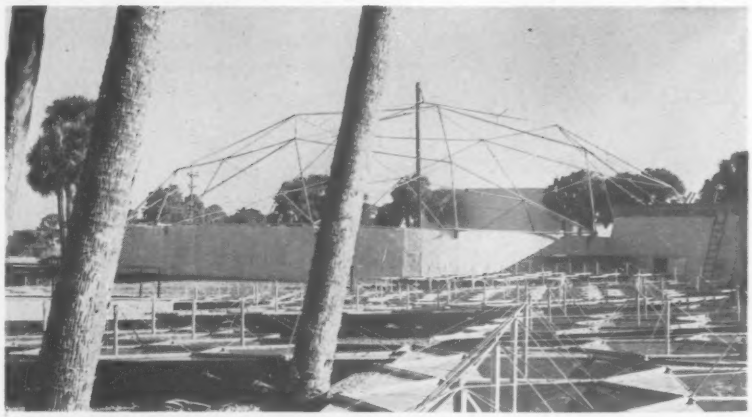
Aluminum panels making up the outer skin were assembled on the site and lifted into place on the pipe frame, previously erected and bolted to 15 telescoping expansion joints attached to the tank wall. The panels, each weighing about 300 lb, were made up of smaller hexagonal units.

The control program was instituted because of occasional complaints from nearby residential areas.

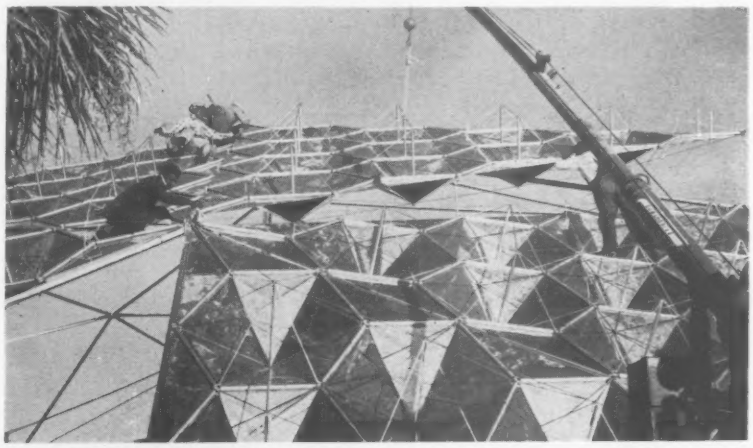
The panels hinge on the pipe frame, enabling dimensional changes in the structure to relieve irregular expansion and loading stress. The hinges also permitted minor adjustments in connecting the panels because of inaccuracies in locating the anchor points.

An adjacent tank was also covered by a space frame. This is a pyramid shaped structure 24 x 24 x 12 ft high.

Smith & Gillespie, Engineers, Jacksonville, Fla., drew up specifications for the job. Jeffery Lindsay & Associates, Los Angeles, fabricated and erected the aluminum pipe and panel components at a cost of $39,500, or $3.08 per sq ft. Weight of the space frame was about 1.1 per sq ft of structural area.



CONNECTED PANELS (foreground) are hung on the aluminum pipe frame erected over trickling filter. The pipes are bolted to anchors attached to the tank wall.



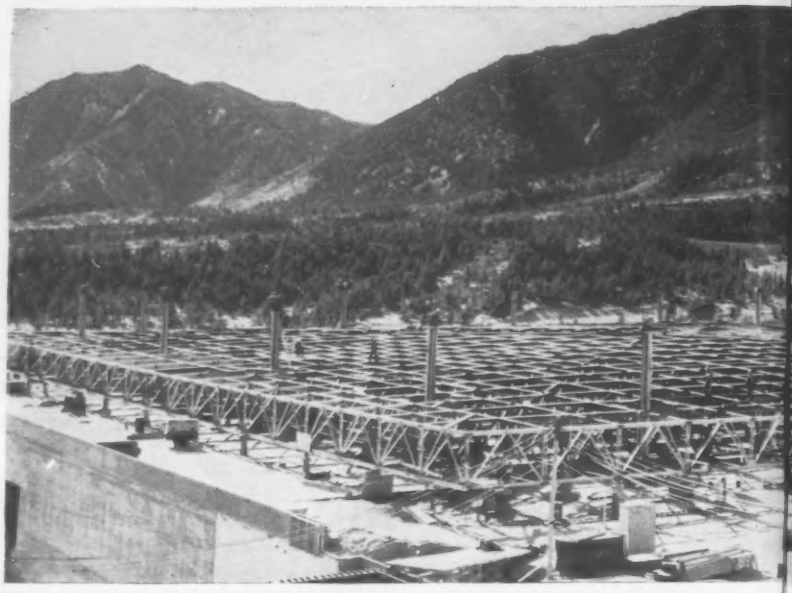
LARGER PANEL SECTIONS made up of the hexagonal units are lifted into place by crane and attached to the pipe frame by hinges to allow dimensional changes.

Jacks on Columns Erect Two-Acre Roof at A

Andrew J. Brown
Consultant
and
Wayne Teng
Assistant Chief Structural Engineer
Skidmore, Owings & Merrill
Chicago, Ill.

Equipment and techniques normally used in raising precast concrete floors by the lift-slab method proved highly successful in erecting the steel-framed Cadet Dining Hall roof at The U. S. Air Force Academy near Colorado Springs, Colo. The big lift was made on January 6, following several days of preparation.

The roof covers an area 308 x 308 ft. It consists of continuous trusses in two directions spaced 14 ft c-c. All joints, splices and intersections were welded to provide continuity. A total of about 1,150 tons of structural steel was used for the roof structure. The trusses are 8 ft. 6 in. deep at the perimeter of the roof and slope up at the rate of ¼ in. per foot to a maximum depth of 11 ft 8½ in.



ROOF TRUSSES FOR THE DINING HALL at the U. S. Air Force Academy were assembled at ground level. The 308 ft square, 1,150 ton network of welded continuous

• Sixteen supports—The entire roof system is supported on only 16 columns. There are four along each side, set back 21 ft from the edge and spaced 70 ft c-c.

The columns are fixed at the bottom. A ball-and-socket joint is provided at the top of each column to eliminate stress due to rigid connections. The "ball" is a stainless steel, 6 in. dia hemisphere. The columns are designed to resist combined forces due to dead load, live load, wind thrust and thermal expansion.

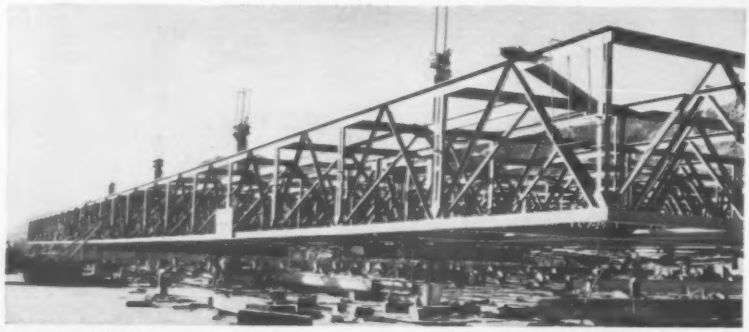
The trusses have chords made of structural T sections. The web members, consist of angles.

• Lifting equipment—A total of 24 hydraulic jacks was used to lift the 1,150 ton roof; two at each of the two intermediate columns along the sides of the dining hall, and one at each of the other eight columns.

The 75 ton capacity jacks were seated on top of the free-standing columns. Each jack had two 1¾ in. dia lifting rods, threaded full length with four turns per inch, which passed through the cap and base plates of the jack and were held in position by locking nuts (marked A and B in an accompanying photo). The roof framing was picked up by engaging the rods in built-up box girders, which in turn were connected to wide-flange beams. These beams picked up the roof system at four panel points.

• Lifting procedure—The lifting procedure was, in principle, quite simple. The hydraulic jack, by pushing up its cap plate, lifted the upper nut, A, which carried with it the lifting rod and the load to be lifted. This operation also had a tendency to lift the lower nut, B. This movement of B, however, was counteracted by a sprocket chain, actuated by a hydraulic motor that kept the lower nut turned down tight against the base plate of the jacking assembly.

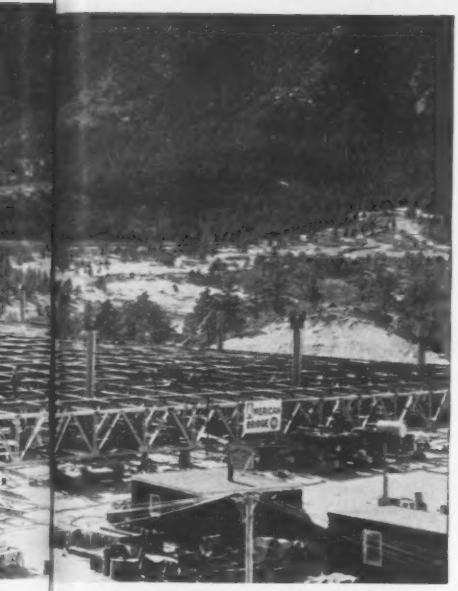
After completion of the 3 in. lift, the pressure in the hydraulic piston was released and the heavy springs between the cap and base plate of the jack pulled the cap plate down into its



PART WAY UP temporary blocking supported the two-acre roof about 6 ft above floor level, while workmen removed unneeded lengths of threaded lifting rods.

AT THE TOP, the roof framing lifted to just above final position, was then lowered

at AF Academy

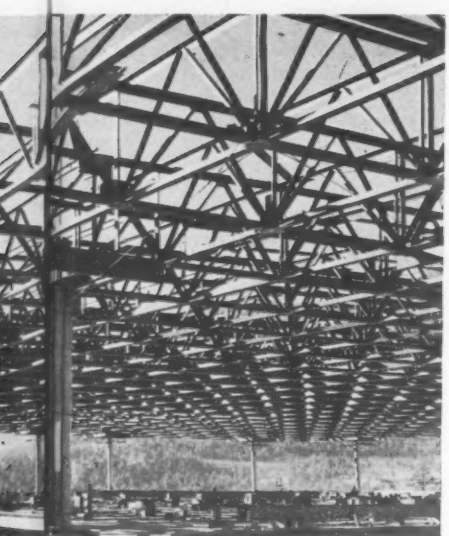


steel trusses was set on temporary blocking to allow for camber and to speed welding.

low position. Simultaneously, the upper sprocket chain tightened nut A and made it ready for the next lift.

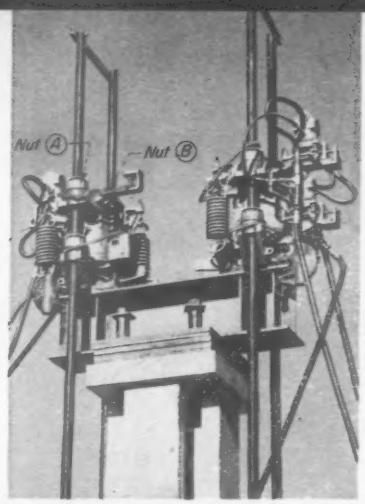
• **Coordinated movement**—The jacks were operated from four consoles, through which passed the high-pressure hydraulic lines, valved for turning the pressure on and off. Indicator lines from the jacks were connected to the consoles to register the number of

(*Continued on page 28*)

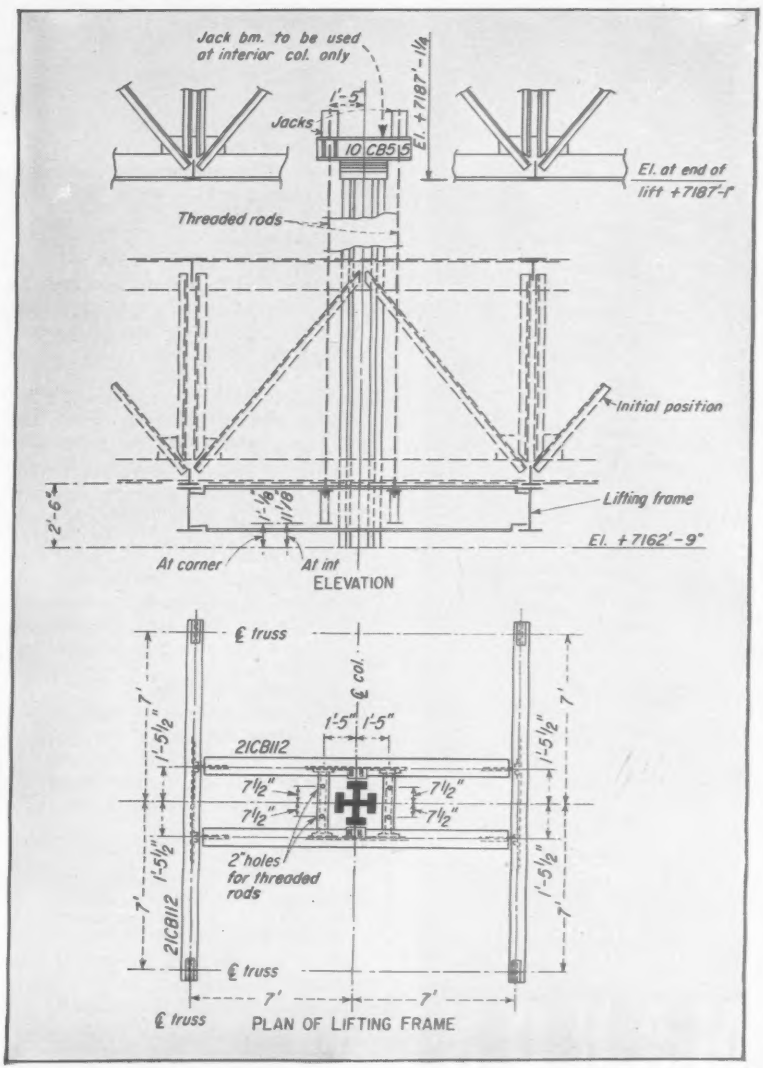


onto temporary posts before permanent attachment.

CONSOLE controlled jacks that lifted the trusses. Four consoles were used.



HYDRAULIC JACK used lifting nuts A and holding nuts B to threaded rods.



LIFTING FRAMES set under roof trusses were raised by means of threaded rods engaged in built up box girders.

WELDED or RIVETED
STEEL PLATE FABRICATION

★ Boiler Casings
★ Boiler Breechings
★ Flues and Ducts
★ Condenser Shells
★ Condenser Piping
★ Heavy Turbine Housings
★ Fan and Blower Housings
★ Dust Collector Housings
★ Industrial Gas Mains
★ Expansion Joints
★ Hoppers and Bunkers
★ Tanks and Vats
★ Pressure Vessels
★ Wind Tunnels
★ Crane Bridge Girders
★ Trolley Frames and Trucks
★ Rigid Frames
★ Roll-Over Fixtures
★ Tank Turrets
★ Gun Mounts
★ Heavy Truck Bodies
★ Engine Frames and Bases
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. . . Dining hall roof raised in two stages

turns the lower nuts made as lifting progressed. One turn of the nut indicated a ¼ in. lift. The maximum lift of each jack was 3 in. Since each jack was individually controlled by its console, the problem of coordinating the lifting movement at various points was rather simple.

The four consoles were interconnected electronically and by telephone. They were placed on top of the structure and rode up with it, which made it easy for the operators to keep the jacks under observation.

• **Erection procedure**—The roof framing was assembled and welded at ground level, on the floor slab of the dining hall. Despite the fact that most of the 1,600 tons of trusses and columns were prefabricated, 27 welders used more than 11,500 lb of welding rod to assemble the big roof at the building site.

The trusses were blocked up to allow for the welding and to take care o fthe camber. The camber was a maximum of 12 in. at the center of the structure. The columns are located at the center of a 14 x 14 ft panel and were erected free standing.

The approximately 22 ft lift made it necessary to extend the standard-length lifting rods with an extension rod. As soon as the whole structure was raised about 6 ft, it was blocked up temporarily at the lifting beams. The lifting rod extension was removed, the standard length of lifting rod was lowered and fastened to the lifting beams, and the lifting operations were resumed.

After the roof structure was lifted 2 in. above its final position, the load was transferred to hydraulic jacks supported on heavy timber posts fastened to the steel columns. These posts were 14 x 14 in. at the intermediate columns and 12 x 12 in. at the other columns. At the same time the four corners of the roof structure were fastened by cables to interior columns to provide temporary bracing.

The stress analysis of the two-way truss system was carried out by John Sbarounis and Michael Gaus, senior structural designers in the Chicago office of Skidmore, Owings & Merrill.

• **Men in charge**—Construction is under the supervision of the Air Force Academy Construction Agency, of which Col. A. E. Stoltz is director.

C. L. Tyler and E. A. Merrill are general manager and director of engineering, respectively, for Skidmore, Owings & Merrill's Colorado Springs office.

The American Bridge Division of U. S. Steel Corp. is the contractor for fabrication and erection of the roof framing. Lewis Hack is erection superintendent. The lifting operation for the 1,150-ton roof was performed under a subcontract by Vagtborg Lift Slab Corp., Los Angeles, with Otto Nass as erection superintendent.

City of Rensselaer Ordered To Boil Drinking Water

Residents of the City of Rensselaer, N. Y., were ordered to boil their domestic water last week. The edict from the Rensselaer County Board of Health was precipitated by the polluted condition of water in the city's distribution system. About 15,000 people are affected by the order.

Rensselaer draws its water from the Hudson River, downstream from several communities that dump untreated sewage into the river. Recent inspections showed that the city's filtration plant, built in 1900, was no longer functioning properly.

Dr. Andrew C. Fleck, County Health Commissioner, said the "boil water" order would remain in effect until chlorination of the water supply reaches a concentration of 7 ppm at the raw water intake. He said the high chlorination is only a stop-gap measure. Additional filtration or other source of supply is required as the permanent answer.

State pollution control authorities in 1952 directed the city to cease drawing drinking water from the Hudson by Jan. 1, 1958 but the city applied recently for an extension while it studied development of a new source.

Explaining the County Health Department action, Dr. Fleck said it had considered the Rensselaer water supply potentially dangerous for several years and that, in the days preceding the order, sampling showed the water had become actually dangerous. As a temporary measure the city has ordered dry feed machines to control acidity of the water and is installing an additional chlorinator to meet the chlorine level demanded by the Health Department.

$51 Million Sewerage Plan Moves Ahead in Milwaukee

The Milwaukee city and metropolitan sewerage commissions have authorized the design of $35 to $40 million worth of new sewerage facilities, including a treatment plant and 30 miles of interceptors. A design contract was awarded to Alvord, Burdick & Howson, Chicago.

The new facilities represent the first phase in a $51 million construction program aimed at providing the Milwaukee area with adequate sewerage facilities through the year 2000.

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÷ Lets You DIVIDE Your Time Between More Jobs. The 11-B combines rubber-tired mobility with maneuverability to handle a variety of scattered jobs. Main machinery arrangement simplifies conversion to hoe, crane, shovel, dragline, or clamshell for added versatility.

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In mud, rock, blazing heat and below-zero cold, the fine-tolerance workmanship of rugged Caterpillar* Diesel Engines keeps the job running on schedule. Wherever steady production is of prime importance, these same basic characteristics—from smooth lugging to the ability to idle for long periods—make CAT* Engines first choice for power shovels, cranes and draglines.

When Caterpillar Tractor Co. first designed its diesel, it paid special attention to durability, a trouble-free fuel injection system, and the capacity to burn a wide range of fuel. Because these features pay off on the job site, Caterpillar Diesel Engines are the keystone of the construction industry. And the fact you can count on them *not* to fail, idling down other equipment, gives these rugged power units a

Several Marion draglines, a Koehring dragline and a P&H dragline—all depend on Cat Engine power to keep the job on schedule excavating in this glacial till and sticky gumbo mud.

Shovel power is furnished by Caterpillar Diesel D375s and a D364 on construction of the Grasse River Lock on the St. Lawrence Power Project, near Massena, New York.

low *final* price the economy-minded spread owner can't afford to pass up.

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Engine Division, Caterpillar Tractor Co., Peoria, Ill., U.S.A.

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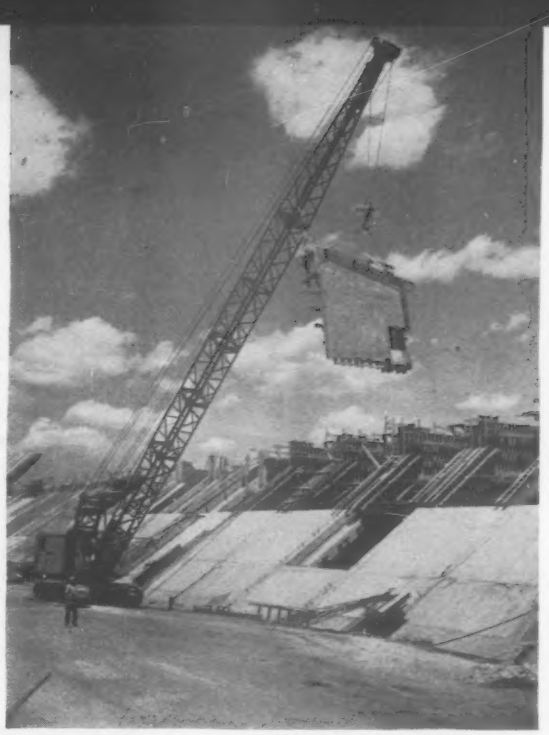
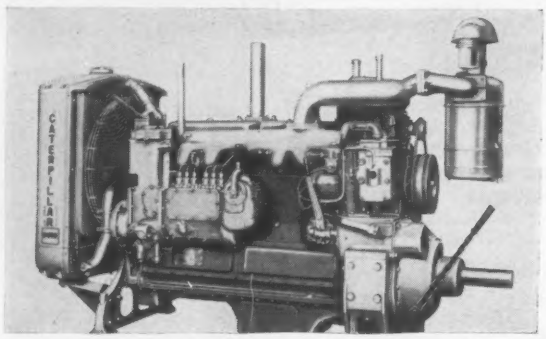


Lorain crane, handling forms for spillway on dam construction south of Mathis, Texas, is powered by dependable Cat D337 Engine. "Like that Caterpillar equipment!" says project supt. J. A. Downey (H. B. Zachry Co.). "The rest of our equipment shows we prefer Caterpillar machines for our money when it comes to moving dirt cheaply: 26 D8s; 5 D7s; 9 D6s; 5 D4s; 1 D9; 8 DW20s; 6 DW10s."



Typical of the Caterpillar line of modern, heavy-duty diesel engines is this sturdy Cat-D318 Engine. Rated at 137 HP (maximum output capacity), its four-cycle design provides a smooth, effective power stroke with an efficient utilization of power. This feature, plus Caterpillar's long life and minimum of maintenance, pay off in dependable service and profitable production.

This Bucyrus-Erie shovel, working on construction of a road to the railroad bridge being built on the Northern Pacific Railroad relocation project near Cumberland, Washington, is powered by rugged Caterpillar Diesel D318 . . . "They're dependable. We don't want any trouble so we get Cat Engines!" says the job superintendent for Hamilton-Thoms, owner.

BY CATERPILLAR

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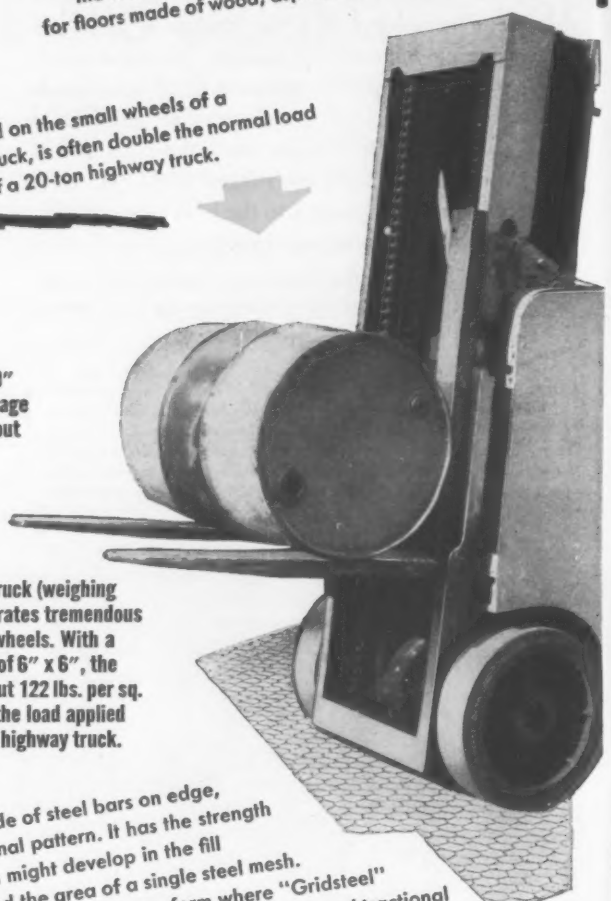

FOR EXAMPLE:

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M-20 TRUCK WHEEL CONTACT AREA

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6" **4400 LBS.** 6"

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Sessions Start

Four state legislatures spotlight road problems

Ways of putting steam behind state highway programs was the theme of 1958 opening sessions of four state legislatures last week.

In **New Jersey,** Gov. Robert Meyner, in his annual legislative message, called for a one cent per gallon increase in gasoline taxes to finance further expansion of the New Jersey highway system.

In **Massachusetts,** Gov. Foster Furcolo filed a bill that called for pledges of federal grants of $200 million through 1960 to get the highway program rolling and to provide safeguards against possible increased roadbuilding costs.

In **West Virginia,** Gov. Cecil Underwood recommended to the legislature increased highway-user and general state taxes to provide additional annual revenue for the state's expanded highway construction program. Although the total new road money recommended fell $13 million short of the $50 million sought by the road commissioner, Governor Underwood explained that the difference would be realized through increased yield of existing taxes, sale of bonds in a revolving bond issue and potential increase of federal aid.

Governor Underwood proposed adjustment in gas taxes, vehicle licensing and registration fees, increased consumer sales taxes, increased business and occupation taxes as well as increased taxes on horse racing to finance the highway building operations.

And in **Kentucky,** Gov. Albert Chandler, in his message to the legislature, recommended tightening the two cent per gallon surtax law that affects heavy trucks, to assure expected revenue from such taxes. Revenues being received by the state suggest that evasion is being practiced. The governor pointed out that the big trucks must bring in the added revenue if last November's $35 million bond issue is not to be jeopardized.

Delaware Speeds Highways As Financial Troubles End

The Delaware General Assembly's recent action in legislating the state out of its financial shortage through new tax laws and spending cuts (ENR Jan. 16, p. 109 and Jan. 9, p. 100) has readied 14 projects of the State Highway Department for advertising of bids.

According to Richard A. Haber, chief engineer, the projects will be advertised as soon as state bonding officers permit such action and approval is received from the Bureau of Public Roads for projects involving federal aid.

Plans and specifications for these projects are available now for prospective bidders. Projects ready for construction include improvement of suburban development streets, modernization of some existing dirt roads and planting along sections of Route 13.

Early Start Is Now Seen For $6 Million Dam Job

A favorable court verdict on the validity of a controversial power sale contract has cleared the way for a July 1 construction start on Markham Ferry Dam on the Grand River in Oklahoma, according to Oklahoma Gov. Raymond Gary.

The $35 million dam—plus associated power facilities that bring project cost to an estimated $60 million—is to be built by the Grand River Dam Authority with $6 million of already appropriated aid from the federal government for flood-control features.

To sell bonds to finance construction, the authority deemed it necessary to have a long-term contract assuring sale of its power. So last August it authorized signing of such a contract with Public Service Co. of Tulsa, under which the utility would buy all of the authority's excess generating capacity. Opponents—rural electric and farm groups—protested the contract, but Oklahoma's supreme court recently upheld its validity.

On the basis of the contract, installed capacity of the project can be increased from 46,000 kw to 100,000 kw. The Army Engineers now are studying the effect of increasing the power capability on navigation improvements under way on the Arkansas River, into which the Grand River drains.

The authority still has to obtain approval for the Markhem Ferry bond issue from bondholders, in addition to a Federal Power Commission license.

Lake Washington Bridge Again Open for Builders

County-city plans to build a toll-free floating bridge across Lake Washington were canceled recently when Seattle city officials withdrew their sponsorship from a $14 million bond issue that had been proposed to finance construction.

This latest action again opens the way for a third party in the bridge picture, the State Toll Bridge Authority, to proceed with its original plan to build a toll structure east of Seattle's Montlake District, about halfway between Sand Point and the existing bridge. It also proposes, at a later date, to construct another toll bridge adjacent to the existing bridge.

(*National Affairs cont. on next page*)

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Briefs

• **Transit authority asked**—In Massachusetts, Gov. Foster Furcolo, in his annual legislative message, asked for creation of a Massachusetts Transit Authority to plan and coordinate programs and policies affecting public transportation. This is considered a step toward integration of the Boston metropolitan area—a step that has failed before because of suburbanites' general distrust of high administrative cost of the city government.

• **First N.C. expressway**—The new three-mile western section of a $15 million four-lane limited-access interstate expressway—the first of its kind in the Carolinas and the second in the South—opened last week. It skirts the business district of Winston-Salem, N. C., and routes east-west traffic through the city. Under construction for three years, the western section cost some $8 million. The 2¼ mile eastern section, which will complete the project, is expected to cost about $7 million. State and federal money provided $14 million of the total cost of the expressway, with Winston-Salem putting up about $1 million.

• **New York City expressway**—Thirtieth Street has been officially selected by the City Planning Commission as the route for New York's proposed $88 million mid-Manhattan Crosstown Expressway. The commission also is pressing for early action on this project, which would link the Queens-Midtown Tunnel on the east side of Manhattan Island to the Lincoln Tunnel on the west side. Although the expressway has been a long-discussed project, construction funds are not now available. Still to be decided is whether the roadway should be elevated or underground. One estimate is that a tunnel might cost as much as $152 million.

• **Another dam for Dallas**—Permission to build a $26 million reservoir on the east fork of the Trinity River is being sought by the City of Dallas after a three year study. Some 490,000 acre-ft of water would be impounded.

• **Must use sewers**—The Nashville city council passed on first reading an ordinance compelling property owners with access to sanitary sewerage lines to tie into the system within 90 days at their own expense. Three readings are required for the bill to become effective.

• **Gold dome building**—A gold-colored aluminum dome bank building will be erected in Oklahoma City, Okla., as the new $600,000 home of the Citizens State Bank. The dome will rest on a circular concrete and glass exterior wall. The building will be 66¼ ft high and have an interior diameter of 145 ft. Bailey, Bozalis, Dickinson and Roloff are the architects. Secor Building Co. is the general contractor, and the dome portion will be erected by Dale Benz, Inc.

• **Lighting standards**—A new laboratory-tested table of lighting standards will be evaluated at the Conference on Light and Vision, to be held at the University of Michigan, March 19-21. The standards are based on eight years of scientific research by Prof. H. Richard Blackwell, who heads the U-M Vision Research Laboratory, and were compiled by the Illuminating Engineering Society. The Conference will present information fundamental to the establishment of optimum lighting conditions. Special attention will be given to school, industrial and business lighting.

• **Gift for construction**—For a time, possibility of completing construction of the $600,000 Oregon Museum of Science and Industry in Portland, Ore., looked bleak. But its walls were raised in a bricklaying bee last summer by the Oregon Unit Masonry Association and the bricklayers union; its roof was placed in a similar bee by roofing contractors and unions. Now, thanks to a $50,000 gift given in memory of Charles F. Swigert, former president of Pacific Bridge Co., by his sons, completion of the structure appears likely by June 1, according to Douglas Huegli, director.

• **Neighbors rap Chicago**—The U. S. Supreme Court gave Chicago and Illinois 45 days to answer a demand by six Great Lakes states for a sharp cut in the amount of Lake Michigan water that ends up in the Illinois Waterway. Chicago's pumpage of lake water for drinking and other domestic uses is estimated at 8,000 cfs, much of which discharges to sewers and thence to the inland waterway. The other states want Chicago to treat the water and return it to Lake Michigan.

• **Fringe parking fails**—San Francisco's fringe parking experiment went out of business last week on the day the operators were to have started paying the city $1,157 a month rent. During the three-month rent-free trial period the operators offered a package parking of car with jitney transportation to the downtown area for 55 cents. The lot attracted only about 50 cars per day. But the city is still hopeful of successful operation of the parking area merely as a lot—with no special transportation included.

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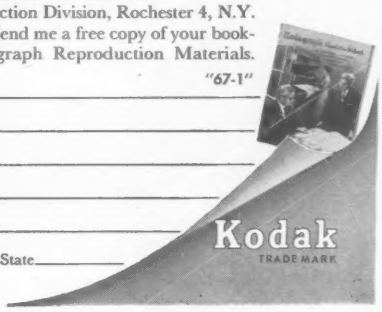


Carving Out a

Subterranean rock excavation is difficult at best, but picture the plight of the contractor whose only access to the jobsite was through a 42-inch diameter shaft, 330 feet deep. On this job he was . . .

TIGHT QUARTERS—Deep in the red shale that underlies much of New Jersey, workers jockey a spoil bucket into place.

City contractors who complained that they have to work in close quarters should watch an operation now going on in Linden, N. J.

At the Bayway refinery of the Esso Standard Oil Company of New Jersey 140,000 cu yd of rock are being removed from tunnels 330 ft. underground, through a 300-ft-deep vertical shaft only 42 in. in diameter. And not only is the excavated material coming out of this shaft, but all of the men, materials, and equipment are fed to the site through it.

On completion, the operation will provide Esso with its first mined caverns for storage of liquefied petroleum gas.

The job consists of mining out five separate sets of caverns—connected by tunnels—with three caverns in one series and two caverns in the other. Each set of caverns will be roughly rectangular in shape, 400 ft long, 240 ft wide, and 20 ft high. Total capacity will be about 675,000 bbl.

The caverns are not completely open, since the roof has huge supports—pillars of shale roughly 35 to 50 ft square—which are left in place during the excavation. These support pillars are actually larger than the excavated area, so that the caverns appear to be a series of tunnels diverging from a common shaft.

Each of the five caverns will be connected to the surface by a 42 in. diameter pipe through which the liquefied gas will be pumped for storage and removed for use.

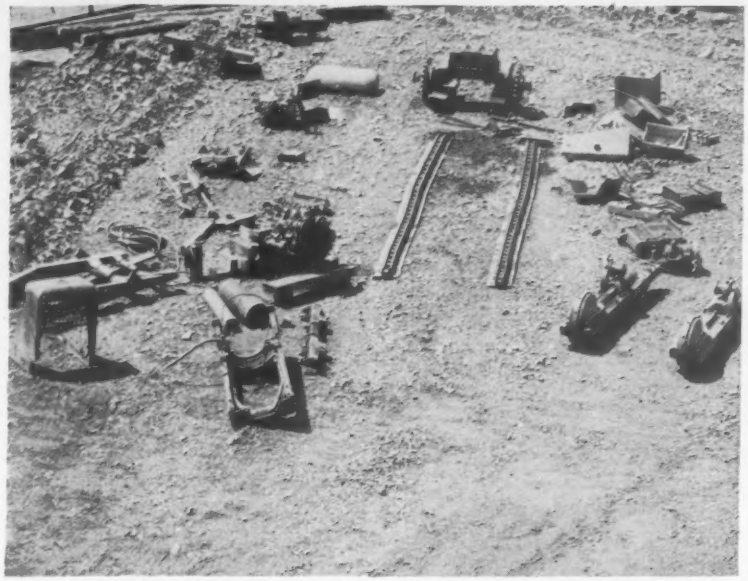
• **Cost considerations**—The storage of gas is always an expensive and difficult problem. Pressure tanks for propane, for example, cost from $14.20 to $16.00 for each barrel of capacity. And the tanks take up space that might well be put to other use.

A mined cavern, however, costs from $2.80 to $5.40 per bbl of capacity—about one-third that of the above ground tanks, according to National Petroleum Council Figures.

The underground storage of liquefied petroleum products is a relatively new technique but one that is rapidly gaining popularity. In 1952, the National Petroleum Council reported 7 million barrels of fuel stored in underground caverns. By 1956, this figure had jumped to 25 million barrels. However, most of this storage was in depleted oil and gas wells. Some (about a million barrels) is stored in caverns that have been dissolved out of natural rock salt deposits.

The process of washing out a cavern in rock salt is inexpensive (from 19

a Cavern Through a "Needle's Eye"



THIS IS A TRACTOR—Dismantled into pieces small enough to pass through the access shaft. At right, the same machine has been assembled in the cavern for use in moving spoil from headings to shaft base.

cents to $1.80 per bbl) and simple: A shaft is drilled into a subterranean salt stratum; and, by pumping water in great volume under heavy pressure, the salt is dissolved and brought to the surface, leaving an opening of the desired size within the stratum.

A cavern cut out of rock strata poses an entirely different problem. In order to maintain the pressure necessary to keep the gas in a liquid state, it is essential that such a cavern be in material relatively free of fissures and that the shaft to the main storage area be small enough to permit practical sealing.

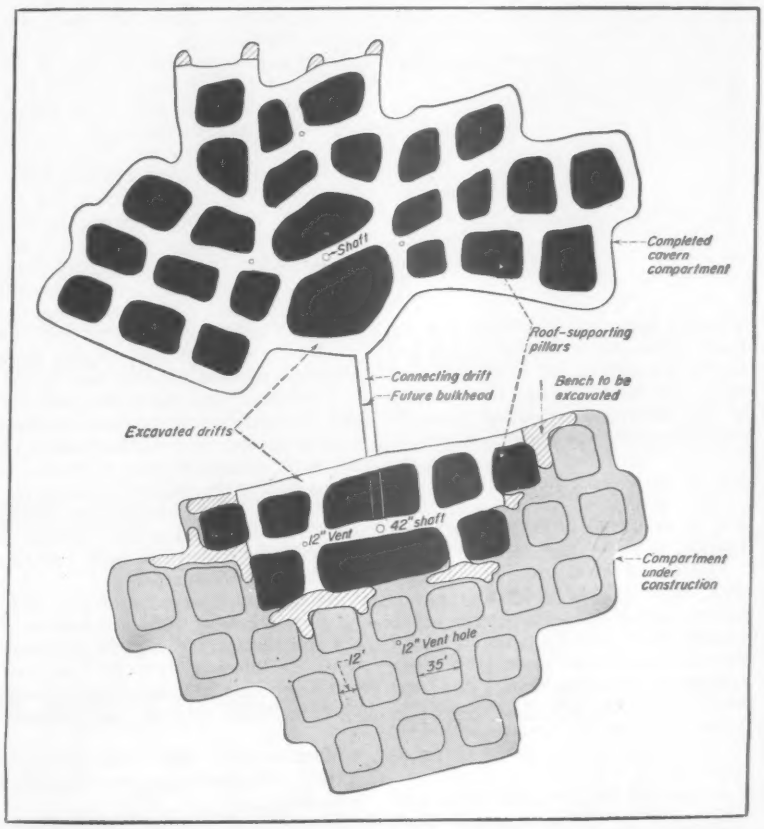
The shaft size requirement is a serious obstacle to construction work, but not to Esso's contractor, Fenix & Scisson of Tulsa, who by using a combination of oil drilling and hard rock-mining techniques have become specialists in this work.

• **The equipment**—The equipment being used on this project looks much the same as any other drilling equipment except that it is probably larger than most seen in the East.

For drilling the shaft, Layne-New York Co., Inc.—subcontractor for Fenix—built two special drill bits, one 17 in. in diameter and the other 52 in. in diameter.

Looking much like concentric rings of pineapples each of the drills consists of a series of roller rock cones mounted on rings of increasing diameters.

The 17 in. drill bit goes down first,



EXCAVATION PLAN of two of the caverns calls for honeycomb in the rock. Solid rock masses (in black) are left in place as roof supports.

. . . Mining through a "needle's eye"

CONVENTIONAL rock mining techniques are the rule after initial hole is enlarged.

to cut out a pilot hole to the full 330 ft depth of the shaft. The 52 in. drill —set up with a 17 in. center core—follows the pilot hole to the full depth.

In standard oil drilling methods, chips cut out by the drill are floated to the top by the drilling "mud". The Bayway shafts are too wide, however, for this sort of work, so a "reverse drilling" method is used: The rock chips are pulled out through the hollow center of the drill shaft by a pump mounted on the drilling equipment. The pump used at Bayway can pass a 6 in. stone or better.

Under the conditions encountered, the average drilling progress for Fenix was between 8 and 10 ft of 52 in. shaft per eight-hr shift.

• **Casing placement**—After the hole has been drilled out to its full width and depth, the bottom 28 ft is filled with sand. The sand is poured in at the top of the hole and permitted to settle through whatever water may be at the bottom. With the sand in place the hole is ready for a steel casing.

The casing is 42 in. in diameter, has a $\frac{3}{8}$ in. wall and is installed in 20 ft lengths.

One end of the first section is plugged with about 5 ft of concrete. Outside the casing two 1¼ in. grout pipes are attached. Also welded to the outside of the metal section are seven other pipes, ranging in diameter from 1 to 2 in., which will carry power and air lines. Metal truck leaf springs are also welded to the outside of the casing to act as centering devices.

Because of the plug, the entire steel casing section will float, in spite of its great weight. Therefore, the first section is water ballasted to bring its top down to a convenient height for welding of the second section to it, and for extending the grout and utility pipes. As subsequent sections are welded, they too are ballasted with water.

When the casing—now lengthened by added sections—reaches the sand plug at the bottom of the shaft, it is aligned as well as possible with the sides of the shaft, and is then pressure grouted in place. The concrete plug at the base is cut out by a 36-in. dia drill.

• **Mining begins**—A valve bottom bailer is used to dewater the casing and remove the sand plug from the bottom of the shaft. Working from a mine can (spoil bucket) a man with a jack hammer drills diagonal blast holes all around the side of the shaft just below the casing. These holes are shot and the spoil falls into the base of the shaft where it remains for the time being.

The hole around the shaft is enlarged and deepened until its floor becomes level with the spoil in the bottom of the shaft. Then two men with shovels begin loading the spoil into a mine can for removal. The shooting and mucking continues. And as the opening is enlarged, more men can work; and the rate of progress increases.

As in most operations of this type, work is started at the roof of the cavern and the excavation proceeds downward. In this way, 4- to 6-ft-long roof bolts can be placed easily, and maximum safety is obtained for the men.

• **Machine work**—When the excavation reaches sufficient size, power equipment goes down.

First machine to go in the hole is an air operated mucking machine. This track-mounted unit is the heart of the spoil removal operation. Self-propelled, it carries behind it a small cart on which the spoil bucket rides. The loader runs up to the broken rock, picks up a load, swings it overhead to the rear, and dumps the spoil into the hoisting bucket. The rig then runs back under the base of the shaft where the full bucket is hoisted to the surface for unloading. Meanwhile, the second bucket, is being loaded. When the "empty" comes back down it is swung aside, the hitch transferred to the full bucket, and the operation repeated. So efficient is this phase of the work than when in full swing, more than 500 bucket-loads (about 200 cu yd) are handled every shift.

At the start of the operation, the bucket loader worked alone. As the work progressed and more working space became available, a tractor equipped with a 1½ cu yd front end shovel was sent down to transport the broken rock from the farthest reaches of the tunnel back to the loading unit. Later, a second air operated mucking machine and a second tractor-shovel followed.

Getting the four big pieces of equipment to the horizontal tunnels was no small task. Each unit was disassembled until no piece was too large to be fitted into the 42-in. dia vertical shaft. At the bottom, the pieces were reassembled, and the machines put to work.

• **Gas testing**—When the initial cavern had reached a capacity of about 5,000 bbl, it was tested. The shaft casing was capped, and two 600-cu ft compressors raised the pressure within the cavern to 115 psi. This pressure was maintained for 24 hr with no loss—providing that the excavation is in rock well suited to the storage of liquefied petroleum gas.

Work is being done in two nine-hour shifts, but actually this is a round-the-clock operation. After the men leave the tunnel for the day, the blasting is done. It takes two to three hours to clear the tunnel of blasting gases before the next crew can go down.

Each blasting charge usually consists of 75 lb of 30% dynamite, and a sufficient number is set off to assure the next crew of enough loose rock to keep them going.

Although the job is not being done under pressure, there is plenty of air in the caverns. Each compartment of the job gets about 6,000 cu ft of fresh air per min. This is blown in through two 12 in. dia and one 8 in. dia intake pipes and is exhausted through a 12 in. outlet. To prevent contamination below ground, the diesel tractors are equipped with catalytic scrubbers.

The project manager for Fenix & Scisson is C. E. Stover, project engineer is Robert S. Mayfield. For Esso, A. J. Geiger is project engineer and A. P. Dennis is field engineer.

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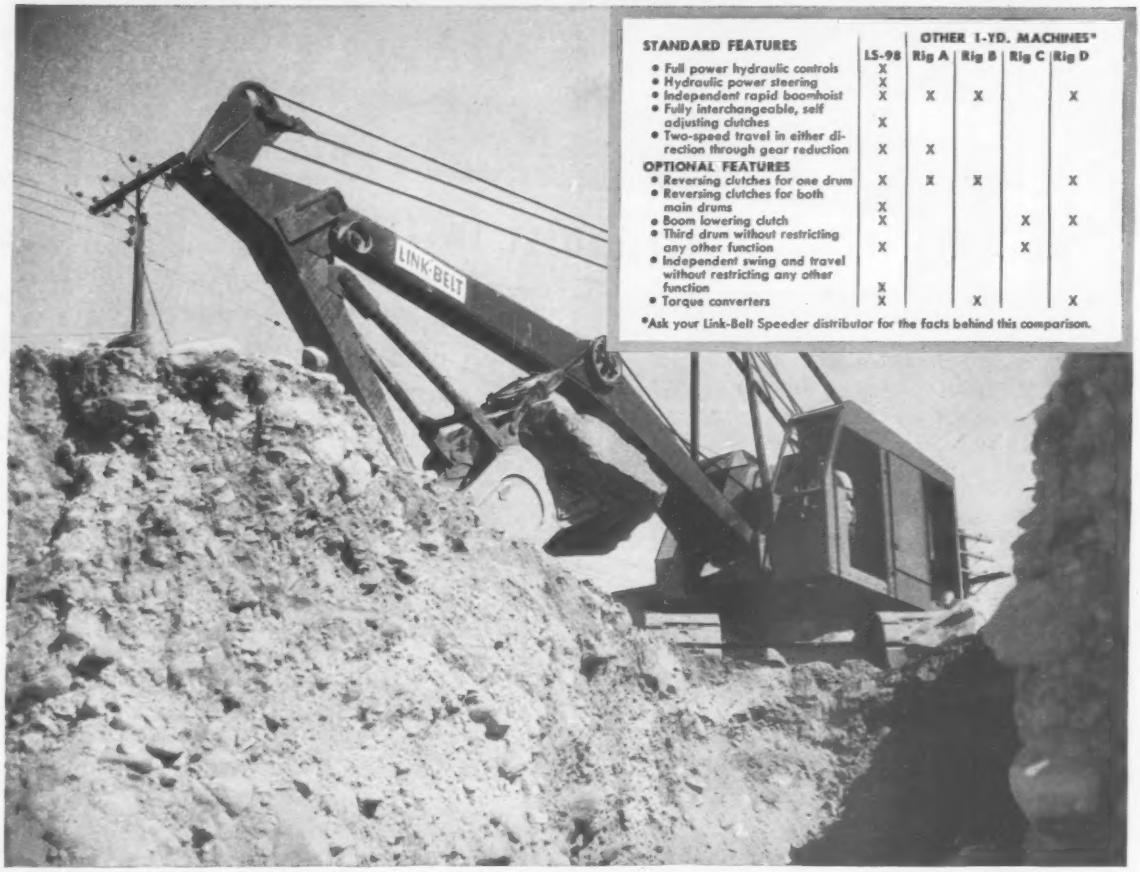

STANDARD FEATURES	LS-98	OTHER 1-YD. MACHINES* Rig A	Rig B	Rig C	Rig D
• Full power hydraulic controls	X				
• Hydraulic power steering	X				
• Independent rapid boomhoist	X	X	X		X
• Fully interchangeable, self adjusting clutches	X				
• Two-speed travel in either direction through gear reduction	X	X			
OPTIONAL FEATURES					
• Reversing clutches for one drum	X	X	X		X
• Reversing clutches for both main drums	X				
• Boom lowering clutch	X			X	X
• Third drum without restricting any other function	X			X	
• Independent swing and travel without restricting any other function	X				
• Torque converters	X		X		X

*Ask your Link-Belt Speeder distributor for the facts behind this comparison.

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Exclusive with Link-Belt Speeder — revolutionary *Full-Function* design provides a separate power train for each machine function.

That's why you can have and use all these 11 major features on the same machine — without restricting other operations.

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And that's why *Full-Function* design spreads wear over more clutches, shafts, gears and bearings. Only the power trains in use are under load!

But this is only one of the many Link-Belt Speeder advantages. You also get —

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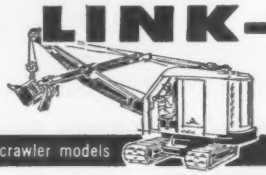
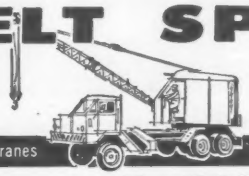
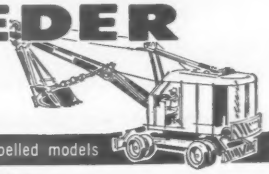

18 crawler models


6 truck-cranes


4 self-propelled models

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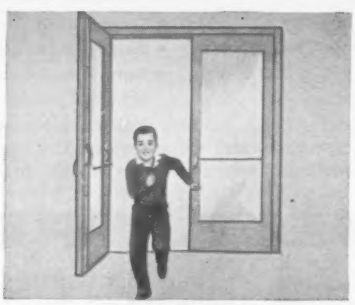

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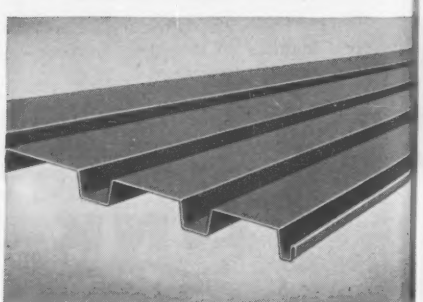

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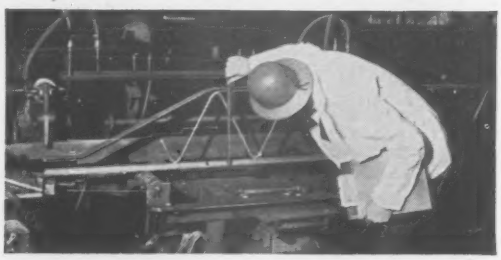
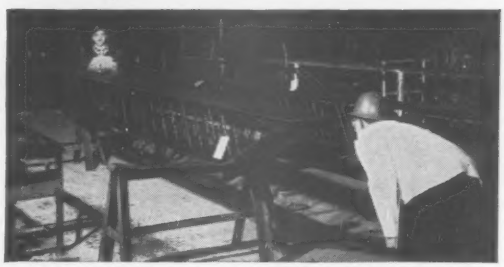


The Quality Verification Program conducted by "this man in the white coat" is a continuing program of checking and inspecting of member company joist manufacturing processes and materials.

This thorough inspection on an unscheduled basis protects the integrity of the Steel Joist Institute Seal of Approval. This voluntary program gives the Seal of Approval real meaning.



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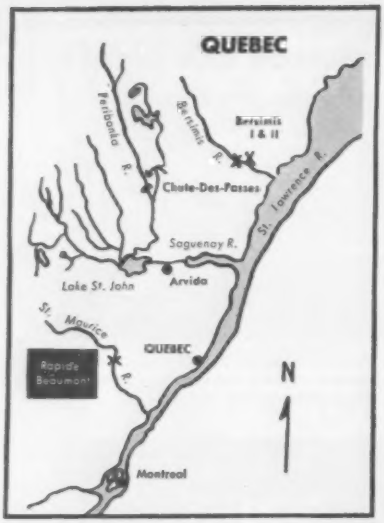
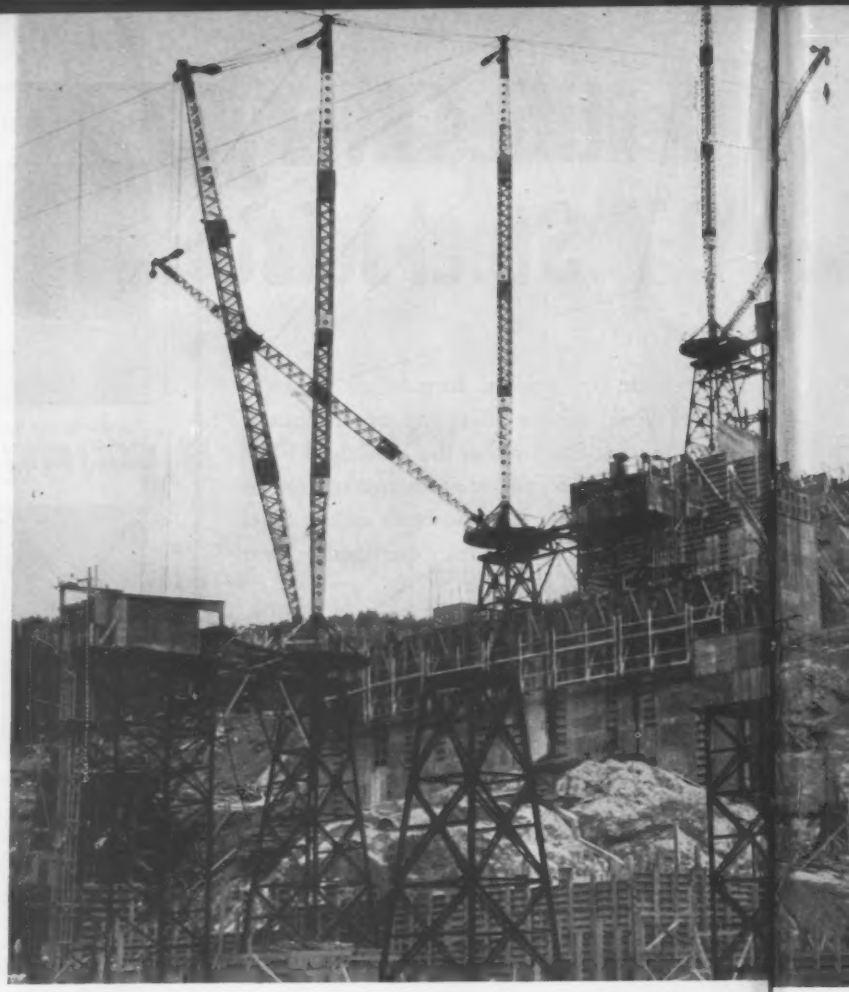


Rapide Baumont is one of four big hydro projects under way on St. Lawrence tributaries in Quebec. (Bersimis I & II and Chute-des-Passes are the others.) The problem here is to complete the project next fall—working through this winter.



Concrete Power Dam Goes Under Wrap for

January, a year ago, while the mercury dipped to −45 F in the St. Maurice River Valley, Shawinigan Engineering Co. placed first concrete in the 400,000 cu yd dam of $56 million Rapide Beaumont development above La Tuque, Que. (pop. 12,000). And now, with about 200,000 cu yd in place, the engineer-constructor subsidiary of Shawinigan Water and Power Co. has a full winter's work to do if—as scheduled—first power is to come from the 246,200 kw Beaumont plant next fall.

Asked if Shawinigan engineers believe in winter concreting, Eamonn McCormack, the assistant resident on the job, grins and answers: "We do it; we don't necessarily believe in it."

Resigned if not enthused, and certainly determined as are their engineer neighbors in Ontario Hydro and Hydro-Quebec, the construction men of Shawinigan Engineering are not stopped by the long, severe Canadian winters. Just as Ontario Hydro's contractor has gone under tarps again this winter on Barnhart Island's 16 Canadian units, and Hydro-Quebec's builder has put up the steam at the 11-unit extension of Beauharnois on the St. Lawrence, Shawinigan is braving the winter now well started at its Beaumont site, 115 river miles above the St. Lawrence.

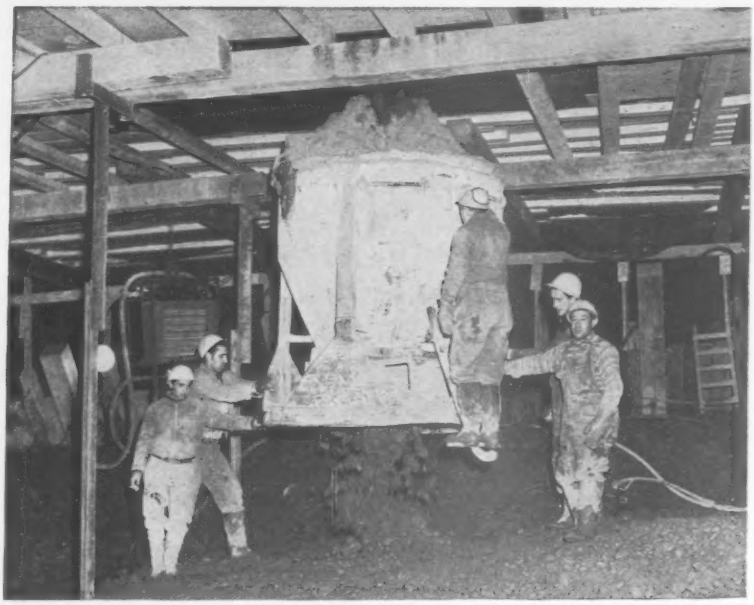
"Low temperatures—which may run for several days at −20F, create a problem," says R. E. Heartz, president of Shawinigan Engineering Co. Then he goes on in a matter-of-fact way to point out precautions of winter concreting: No frozen material; surfaces heated to 40 to 50 F; tarp-covered wood-frame enclosures; steam-fed unit heaters; live steam in the sand—and the course aggregate, too, if it's extremely cold; heated water; 60 to 80 F concrete coming from the mixers. All similar to Ontario Hydro practice, which has been described (ENR Mar. 7, 1957, p. 23).

• **Open design**—Constructors at Rapide Beaumont are shifting enclosures about as they work, and future operators of the power project will do likewise. For this north-country power station is to be of outdoor design—just as is the big, international St. Lawrence Power Dam at Barnhart Island. Saving the cost of the usual steel, brick and glass powerhouse, designers merely have put a divided, sliding cover over each of the six units. And the gantry for lifting units to be serviced will have sides to enclose it and the units for winter operation.

Aside from the outdoor design innovation, the Beaumont development will not be unlike its recent predecessors among the seven St. Maurice River power dams of the Shawinigan systems.

• **One among seven** — First of these seven was the Shawinigan Falls project, begun in 1903 and completed to 310,700 kw capacity in 1949. At this falls there have been three plants, actually. The 1903 plant has been dismantled and the No. 2 and 3 plants now function. Then started 149,600 kw Grand

PORTIONS OF DAM ARE ENCLOSED with tarp-draped timber frame covered with sheets of insulating board. Temperatures down near —20 F are common here.



CONCRETE IS PLACED "INDOORS" as hatch is opened in enclosure to permit bucket to enter steam-heated area. Cold outside, its relatively warm in here.

ps or Winter

'Mere in 1916; La Gabelle started in 1924 toward today's 128,300 kw; Rapide Blanc (some 136 river miles up from the mouth of the St. Maurice at Trois Rivieres and thus the farthest upstream of the existing seven) had its first operation in 1934 and is now a 182,400 kw plant; La Tuque followed in 1940, to reach 202,500 kw capacity in 1955; and Trenche, the system's biggest, is a 281,000 kw project that produced its first power in 1951.

Rapide Beaumont, number seven, will bring the river's total installed hydro capacity to just over 1.5 million kw, or about 2 million hp. Only three upstream sites remain on the St. Maurice. Farther upstream than the present seven dams, they total about 240 ft of head, with total potential capacity of some 300,000 kw.

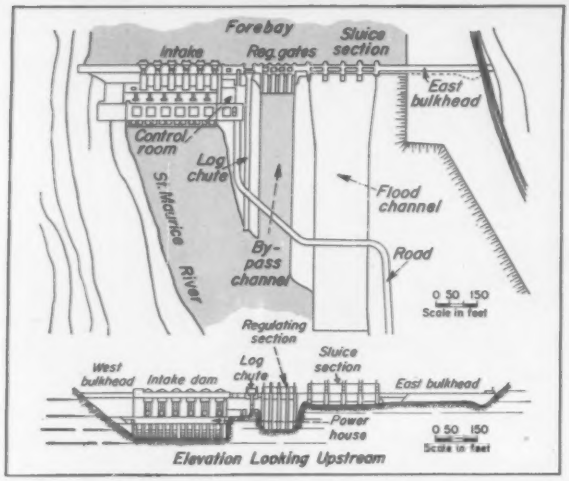
• **On a harnessed river**—The St. Maurice is actually a 325 mile river, but above mile 237 it is controlled by Gouin Storage Dam, which was completed in 1918 by Quebec Province.

Effect of this dam's 6.4 million acre-ft of storage (plus the storage developed later on tributary streams) has been to improve the firm flow in the St. Maurice from 6,000 cfs to 20,000 cfs at its mouth. Water, withdrawn from the Gouin Reservoir passes through each of the company's six, soon seven, relatively low head plants.

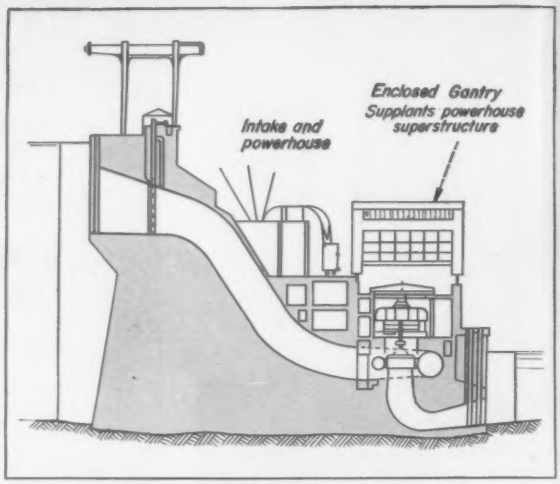
• **With a long tailrace**—Rapide Beaumont's gross head is to be 125 ft. And to get this by building a 180 ft high dam, it will be necessary to dig a 2 million cu yd tailrace to extend 2 miles downstream. A half-million-dollar, 14 cu yd walking dragline arrived at the site last fall to tackle that job. The excavation will be almost entirely in gravelly material, including sand and boulders.

Aside from its long tailrace-channel and its outdoor power feature, the project will have a steel-flume log-chute extending some 500 ft down-

. . . North-country power dam is of outdoor design—no superstructure



GATED DAM will have paved flood channel and log chute. Regulating gates provide diversion during powerhouse construction.



OPEN DESIGN calls for hatches over each of six generators, but an enclosed gantry takes place of superstructure.

stream from top-of-dam, to pass the river's heavy flows of pulpwood. At the top of dam, water jets will "steer" logs into the chute. Next to this log chute will be four 21x21 ft regulating gates, then come four larger (31 ft 6 in. high x 50 ft wide) roller sluice gates to pass flows down a broad, paved channel to the tailrace in time of flood. (Flood flow gets to 60,000 cfs.) All these features add up to a 1,600 ft length for the dam and its intake.

• **A simple diversion** – The diversion scheme was simply to cut a channel in the rock of the left bank, through the spot where the regulating gates are to be. This section of the dam then was built in the diversion channel, with three openings left to pass the river's flow.

A rock plug was blasted from the diversion channel, and cofferdams placed upstream and downstream then permitted dewatering of the river bed for construction of the power-intake portion of the dam.

When the powerhouse is sufficiently completed for the river to be pushed through its six 21 ft steel-lined penstocks, gates will be dropped over the openings now carrying river flow, and these openings then will be plugged with concrete. The regulating gate length of the dam will then be completed.

• **Seven-foot lifts**—But lots of concrete must be placed first in the 400,000 cu yd structure. A 50,000 cu yd per month rate will be maintained through winter, to be slowed down next year as the smaller pours around power units and gates are reached.

All mass concrete in the structure will be placed in 7 ft lifts (a low standard for Canadian construction, at least when compared with Ontario Hydro methods).

All concrete is founded on rock, of course, but finding rock in the intake area took a lot of time-consuming digging. Potholes and a 75 ft wide, 40 ft deep void in the usually solid granite had to be cleaned out and concreted full before founding the first 7 ft lifts at this spot.

There will be a minimum 15 ft grout blanket under the whole dam and a 150 ft deep grout curtain along its upstream face.

• **Naturally available aggregate** – Two concrete plants, each with 2 cu yd mixers, feed the job air-entrained (for frost resistance) concrete made of sand and natural, rewashed aggregate in three size ranges up to 5 in. Gravel pits, extensive in this area, are worked with shovels, with truck and belt conveyance to the screening plant.

First stage screening scalps plus-5 in. material and removes minus-$\frac{3}{8}$ in. material by dry process. The second stage is a wet-process washing and sizing into three ranges: $\frac{3}{8}$ to $\frac{3}{4}$ in., $\frac{3}{4}$ to $1\frac{1}{4}$ in. and $1\frac{1}{4}$ to 5 in.

No crushing was required; sand was found, not manufactured. The aggregate plant will have produced 385,000 cu yd at an average of 18,300 cu yd per week.

Concrete is trucked from the mixing plant, and placing at the dam is from 3 cu yd buckets to be handled by a total of 14 guy derricks, when they are all erected.

• **Rail relocation**—The work force that began building up in spring of 1956 and will reach a peak of 1,500 next spring has had more to build than just the dam. Kennedy Construction Co. of Montreal contracted to relocate 10 miles of the Canadian National Railway's transcontinental line where it follows the St. Maurice River past Rapide Beaumont. This vital (although not heavily traveled) single-track line had to be moved to the river's left (east) bank by construction of a through-truss steel bridge upstream. This bridge is 75 ft above present water level, and due to difficult foundation conditions, its deepest pier is founded 100 ft below the river's natural level.

Just downstream from the dam, the relocated rails pierce a mountain with 750 ft of tunnel, an inverted U-shape 17 ft wide, 23 ft 6 in. high, and concrete lined for all but 300 ft of its length.

• **On 2½ year schedule**—With its winter work force stabilizing near 1,200 men Rapide Beaumont was a hustling dam construction job this week in spite of the cold. And hustle it must if its power is to travel new transmission lines to Trois Rivieres less than a year from now.

The men who will see to it that this happens are Elwyn Brock, general superintendent, Ludger Gerbeau, project manager, and John Russ, resident engineer, on the job. In Montreal, the Shawinigan Engineering Co. men most involved with construction are R. E. Heartz, the firm president and J. A. Burke, vice president in charge of construction.

Design of the project has been under G. R. Rinfret, vice president in charge of engineering; J. A. Thomas, chief engineer of the civil division; and R. E. Grout, chief engineer of the electrical division.

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Our natural traffic arteries, the rivers, today bustle with increasing transportation of all kinds of bulk materials. Efficient "parking" facilities, such as this coal loading dock on the Ohio River are needed to load and unload barges at terminal points. Made up of a series of steel sheet pile cells, filled with sand and gravel and capped with concrete, these docks are low in first cost and need little maintenance. The number, diameter and height of cells is determined by dock size and location as well as variations in river level. Two or three or dozens may be used. Large installations, equipped with barge shifting and unloading machinery, have been constructed to handle as many as sixty barges.

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MAIN BUILDING in new airplane developmental center consists of final assembly area (left), two-story experimental section (right) and structural test area (far corner).

Structural framing in the Boeing Developmental Center, Seattle, includes long-span steel trusses in one section and prestressed beams and precast columns in another of a huge experimental factory

Building a Factory Fast With Steel and

The $23 million developmental center for Boeing Airplane Co. at Seattle was designed and erected in only 20 months. Yet, more than 1 million sq ft of floor area are provided in the six buildings that will comprise the research and development project.

A substantial portion of this space is in a 540x850 ft building designed as "an experimental factory" and to handle factory subassembly work, as needed. It incorporates a one-story, steel-framed final assembly area with steel roof trusses spanning 300 ft and a large two-story concrete section with precast and prestressed framing, prestressed walls and precast roof deck.

• **Assembly-line precasting**—Precast elements, other than 30 ft long prestressed beams for the second floor, were fabricated on the site. The 30 ft beams were cast in a commercial plant and were both pretensioned and post-tensioned. The rest of the prestressed beams and girders were post-tensioned.

The precast columns in the two-story section are alternately 25 and 50 ft high, the shorter ones terminating at the second floor. Hence, the second floor has bays twice as large as first-floor bays; column spacing is 30x40 ft in the first story, 60x40 ft in the second.

The second floor consists of a cast-in-place structural slab supported on the 30 ft prestressed beams, which are spaced 10 ft c-c. These, in turn, rest on 40 ft prestressed girders.

In contrast, the roof is a precast concrete deck. It is carried on 40 ft prestressed beams, which also are spaced 10 ft c-c and which are seated on 60 ft prestressed girders. (The roof framing runs perpendicular to the second-floor framing.)

In general, the 60 ft girders were prestressed with four tendons—12 wire strands in flexible steel tubes. The cables were preassembled and later set in position in a reinforcing cage. The strands, with an ultimate strength of 256,000 psi, were tensioned to 134,000 psi.

Fabrication was expedited by using assembly-line techniques and reusable steel forms. The general procedure was to install a reinforcing cage on the casting bed and erect the steel forms. Then, the forms were filled with concrete, which was required to have a 7 day strength of 5,000 psi.

• **Conveyor speeds concreting**—Instead of using a crane and bucket for this purpose, the contractor found he could place concrete faster with a portable conveyor. It was attached to the rear of a truck mixer, which traveled down

300 FT TRUSS was erected on steel falsework over the final-assembly area.

PRESTRESSED BEAMS support the roof of the two-story section of the experimental factory. Steel projecting from the top flange will be embedded in cast-in-place concrete, tying the precast concrete roof deck to the beams.

ee and Concrete

a center roadway parallel to the forms. The conveyor relayed the mix from the truck to a chute directly above the forms. In this manner, the 8 cu yd of concrete for a 60 ft girder could be placed in the forms in about 10 minutes—a saving, the contractor estimates, of about 25% in time compared with a crane and bucket.

The forms were stripped within eight hours after casting. When the concrete attained a strength of 4,500 psi, generally in three days, the strands were tensioned with portable double-acting jacks, which also drove conical wedges into position to anchor the tendons at the girder ends (Freyssinet method).

• **Double-steering transport**—The 60 ft girders, weighing 16 tons, were removed from the casting beds by a crane. Transportation to the construction site, however, required a special rig and a minimum of maneuvering.

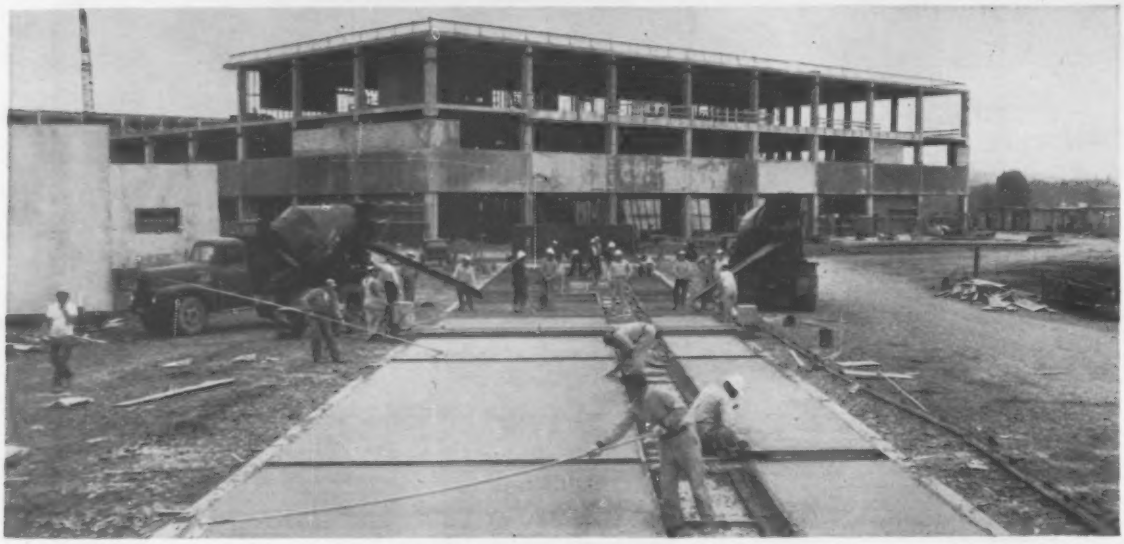
The contractor used for this purpose a tractor-trailer with independent steering equipment on the rear unit, operated by a man seated on it. At the site, a 25 ton crane took over the handling assignment. The cranes utilized cable loops cast in the tops of the beams and girders for lifting.

• **Simple erection**—Erection proceeded much as for structural steel. The precast, reinforced concrete columns were plumbed and bolted to completed pile caps. A crane set the girders on con-

CONVEYOR, moving along with a truck mixer parallel to steel forms, speeded concreting of the prestressed beams, which were fabricated by assembly-line methods.

PRECAST BUILDING is framed with concrete columns alternately one and two stories high; so second-floor bays are twice as large as those on the first floor.

. . . Walls are prestressed for developmental-center building



CASTING BEDS 240 ft long for fabricating prestressed concrete wall panels were set up on the floor of a nearby building.

crete brackets that had been cast integrally with the columns. To insure uniform bearing, a 2 lb lead sheet was placed under the girder ends, and a fillet weld was run down each side. Beams then were seated on integral concrete brackets on the girder webs.

Column-to-girder connections were designed to take all vertical loads and lateral wind and seismic forces independent of the walls.

Before the slab was concreted for the second floor, reinforcing steel for negative bending moment in beams was placed over supports, and girders were shored at midspan. Bent bars projected from the tops of beams and girders to tie them to the cast-in-place slab. After the floor forms were stripped, the shores were removed from under the girders. The resulting decrease in girder camber was $\frac{1}{2}$ in.—from $\frac{3}{8}$ to $\frac{1}{8}$ in.

The roof framing was erected in a similar manner, except that the roof deck consisted of 4x10 ft precast units made of lightweight concrete. Cast-in-place concrete, embedding bars projecting from the precast elements, was used to tie the deck to the beams.

To insure flexibility for equipment installation, steel inserts were provided in beams, girders and columns. Rated at 1,000 lb per lin ft maximum load, the inserts will be used initially to support 2 miles of bus duct; 4 miles of trays that carry electric feeders, telephone, signal and paging-system cables; 40 miles of conduit; 19 miles of piping; 7,600 lighting fixtures, and ventilating ducts.

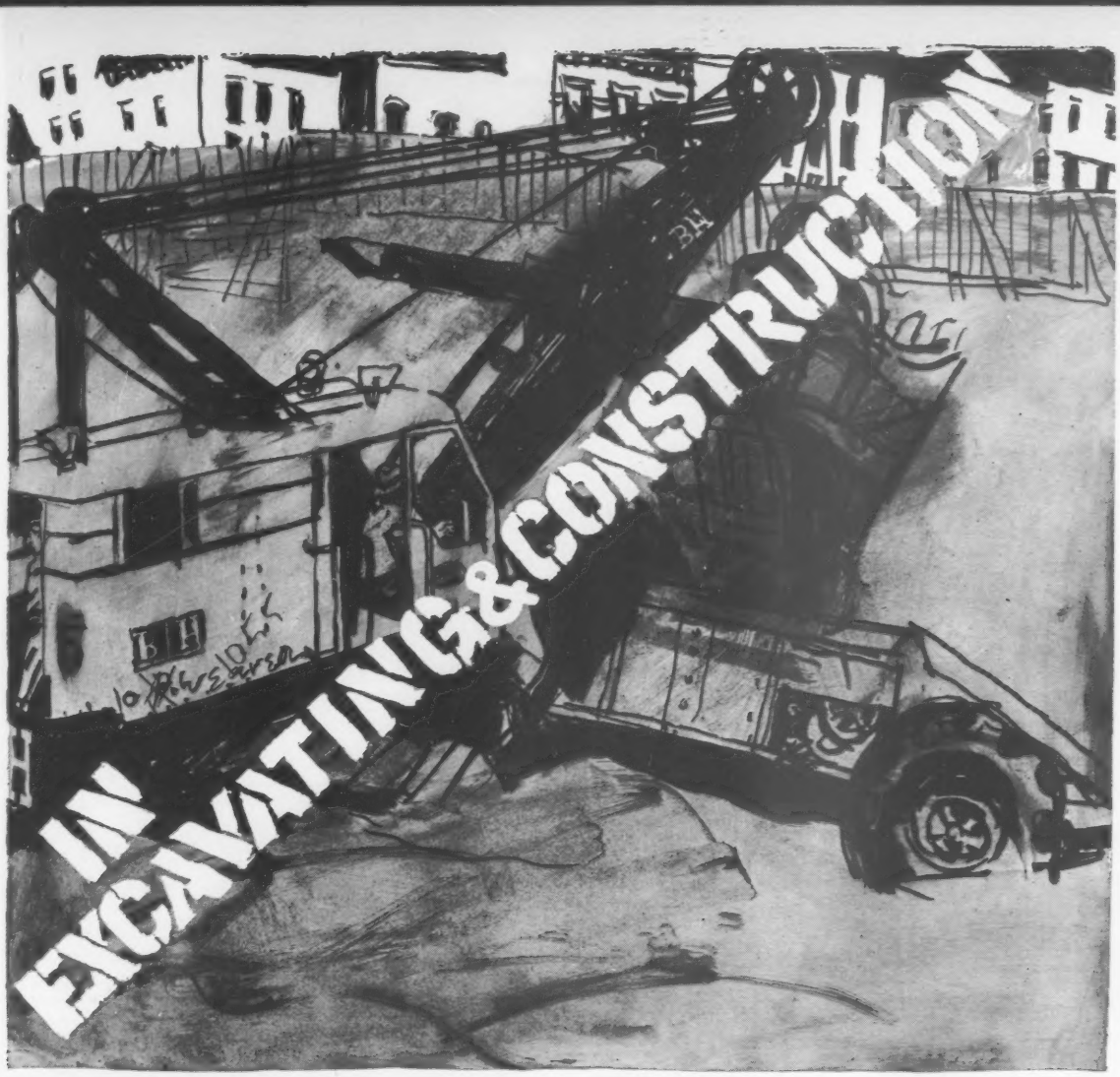
Similar provision was made for installation of cranes, monorails and other heavier service loads, which will be supported from 2 in. dia sleeve inserts in the beam webs. Spaced in a regular pattern from 6 to 8 ft c-c, the inserts will be used initially to support 31 monorail systems.

HYDRAULIC JACKS react against a fixed end block to tension several strands simultaneously at one end of the casting bed for the wall panels.

PARAFFIN JACKS used at the opposite end of the casting bed, were unloaded by electrically heating and melting the paraffin, transferring prestress to the panels.

• **Prestressed walls**—With the frame erected, enclosure of the building with precast, prestressed panels followed.

Made of 4,000 psi lightweight concrete (115 lb per cu ft), which also serves as insulation, the wall panels are 40 ft long, spanning between columns. They are 5 in. thick. Height is 13, 17



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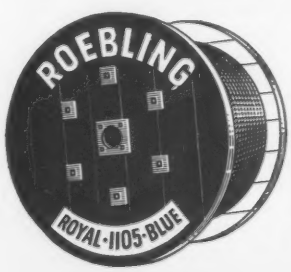

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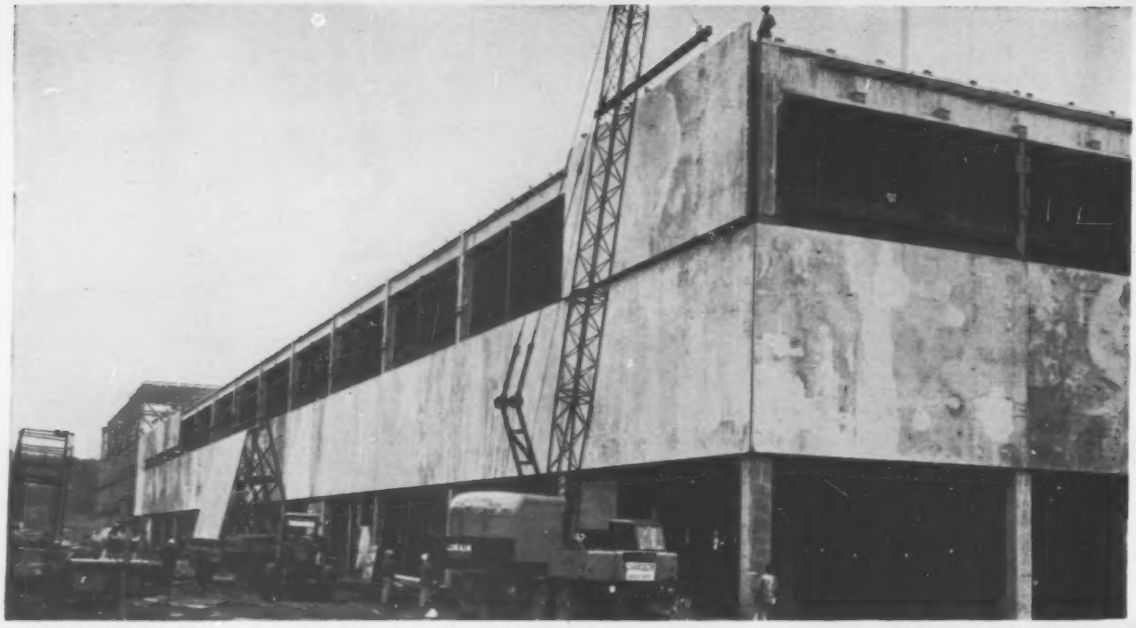
. . . Precast concrete framing is enclosed with prestressed walls



PRESTRESSED PANELS, long enough to span 40 ft between precast concrete columns, were erected by a rubber-tired crane. Steel wind columns brace the panels at midlength. The precast wall units were bolted to angles on the columns.

and 20 ft, the largest weighing about 20 tons.

The panels were fabricated on two 240-ft casting beds set up on the concrete floor already placed for a nearby building. For stressing tendons, a fixed jacking block, consisting of two 8 in. channels filled with concrete, was anchored at each end of the casting beds. Also, a movable block was provided at each end.

After the side forms were positioned, ⅞ in. dia. seven-wire strands for prestressing the panels were placed in the forms 7½ in. c-c and attached to the movable end blocks. For applying the tension to the strands, portable hydraulic jacks were used at one end of each bed, pushing against the movable block and reacting against a fixed end block. Also, 5 in. paraffin rams were employed at the other end, stressing the strands to 180,000 psi (ultimate strength 256,000 psi). The strands then were anchored to the fixed end blocks.

After concrete was placed in the forms, it was screeded with a rotating mechanical screed, which also vibrated it. It then was hand finished.

When the concrete attained a strength of 4,000 psi, the prestress was applied gradually. This was done by electrically heating and melting the paraffin in the paraffin jacks, slow escape of the liquid allowing the stressing forces to be removed from the ends of the tendons. The strands then were released from the end blocks and cut between panels.

A crane removed the panels from the casting beds. For the purpose, it hooked onto lifting loops on the 13 ft high panels and strongbacks on the 17 and 20 ft high panels. When they were in a vertical position, the wall units were handled by loops on top.

In accordance with the erection schedule, panels either were stockpiled on large timber A frames or transported to the erection site, which sometimes was one-quarter mile away. They were moved in a steel A frame set on a 100 ton flat-bed trailer. A 35 ton motor crane positioned them.

The wall panels were set in two horizontal courses, the lower one 20 ft high and the upper one generally 13 ft high, with a 4 ft window between. Until they could be bolted to the building columns, the panels were supported on steel seat angles. (To assist the walls in resisting wind and earthquake forces, the panels were braced at midlength with light steel columns.) For the final connection, three steel clip angles were provided for each panel at the columns, slotted holes allowing for adjustment. Three bolts were slipped through each angle into ¾ in. dia inserts in the panel. Then, to lock the connection, plate washers on the bolts were welded to the angles.

• **Long-span trusses**—At one end of the two-story prestressed concrete structure is the steel-framed final-assembly section. In plan, it is 540x350 ft. The roof is supported in the 540 ft direction on two-span continuous trusses 50 ft c-c, providing a minimum clearance above the floor of 45 ft.

The trusses, 24 ft deep, span 300 and 240 ft.

Spanning the 50 ft between these trusses are 12 ft deep roof trusses, spaced 25 ft c-c.

Sway bracing was permitted only in the end walls. The steel columns were designed to withstand the lateral forces in the other direction. As a result, some of these members are very heavy —built up with a 14 in. WF 246 core plus two 18 in. WF 96 sections and two 24 in. WF 145 sections arranged at 90 deg with each other.

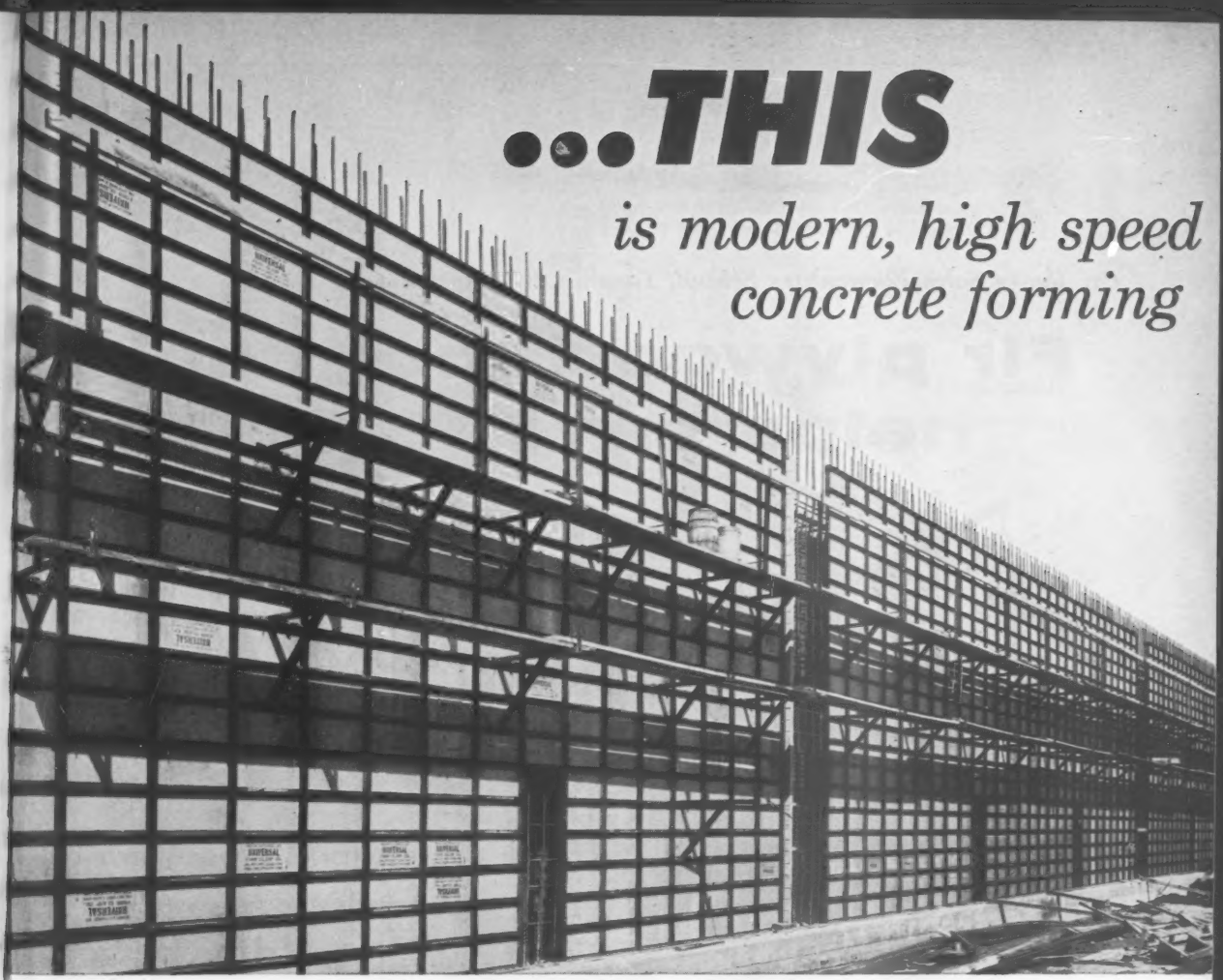
• **Test section**—Completing the experimental factory, a structural test area 120x240 ft, with 35 ft overhead clearance, is located at one corner of the two-story concrete section. Its roof is supported on 120 ft steel trusses, spaced 20 ft c-c.

Structural testing of components will be done with a variety of equipment. A 1 million lb test machine will perform compression, tension and bending tests. A "strongback" near the center of the test area, on a special pile foundation, will provide a vertical working surface for attachments capable of withstanding 25,000 ft-kip moments.

The project was designed and built by The Austin Co., Cleveland. Arthur R. Anderson, Tacoma, Wash., was consulting engineer on the prestressed concrete elements.

...THIS

is modern, high speed concrete forming



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of concrete forming capable of handling virtually any type of poured concrete structure. UNI-FORMING is faster because assembly of UNI-FORM Panels with UNI-FORM Ties and Tie Keys is a simple mechanical (and automatically accurate) process . . . faster because minimum alignment and bracing is required on 1 side only . . . faster because every forming requirement is engineered into the system. In addition to its speed you'll find that the UNI-FORM System of concrete forming has many other advantages you can use to save time, money and labor.

UNI-FORMING HAS 3 BASIC ELEMENTS

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The UNI-FORM Panel is plywood faced, steel framed to provide strength and rigidity plus all the advantages of a nailing surface. Made in standard heights from 1 ft. to 8 ft.; widths 2 ft., 18".

2.

UNI-FORM Ties lock and spread UNI-FORM Panels. Made for all wall sizes. Special ties available.

3.

UNI-FORM Tie Keys securely lock Panels and Ties together.

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On James Sales Elementary School, Tacoma, Washington

Fir plywood roof deck helps save $3,300^{00}$

ALTERNATE COST DATA

Summary of installed costs per M sq. ft. Based on actual suppliers' quotations and time records where available and on Walker's Estimator's Handbook where not:

1. As built, with clips, eliminating blocking at panel edges. Includes cost of new plywood and 50% of initial cost of exterior plywood salvaged from forms $169*
2. Estimated cost as built but using all new sheathing with no salvage from concrete forms $187
3. Estimated cost all new sheathing with 2 x 4 blocking at panel edges . $206
4. Estimated cost 2 x 6 T & G decking . $291

*169.00 per M "as built" cost represents $122.00 per M savings over estimated cost of 2 x 6 T & G decking. On this basis, savings on entire job total $3,300.00.

To eliminate 2 x 4 blocking, metal "H" clips were used at unsupported panel edges. Two clips were used for each span. (Clips were responsible for approx. $20 per M of savings; see table above).

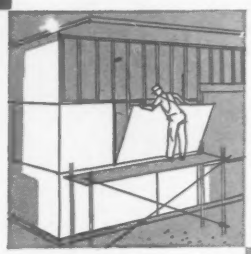
JAMES SALES ELEMENTARY SCHOOL:
Tacoma, Washington
ARCHITECTS: Lea, Pearson and Richards
CONTRACTOR: Nelson Construction Company
STRUCTURAL ENGINEERS: Smith and Murray

5 ways Fir Plywood builds better schools

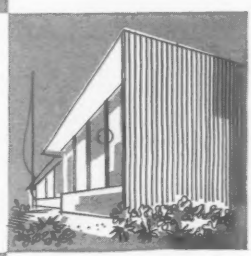
AN EXCELLENT EXAMPLE of how fir plywood roof decking sharply cuts costs as well as provides markedly superior construction is this new U-shaped, 1-story reinforced concrete school.

The contractor estimates ¾" fir plywood saved a total of $3,300.00 on the job; $2,800.00 in actual installed cost, plus an additional $500.00 by amortizing costs of some of the panels previously used for forms. A total of 27,000 sq. ft. were used on the job. Design calculations by the architects show plywood superior in resisting racking forces such as wind loads and earthquakes.

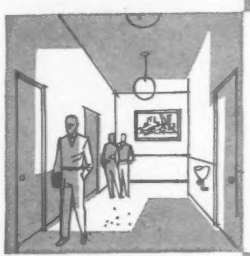
Although many home builders have found thick plywood over wide rafter spacing saves money, this is one of the first detailed cost analyses for a larger building. The idea points the way to new opportunities for reducing costs on commercial and industrial buildings as well as schools.



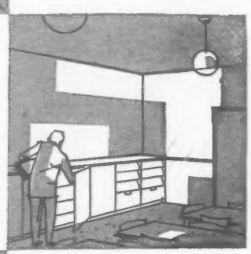
1. Strong, rigid, easy-to-apply wall and roof sheathing.



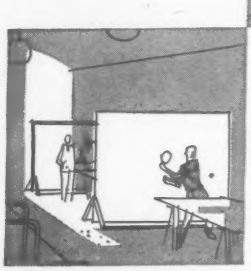
2. Smart, durable siding, soffits and exterior trim.



3. Attractive, damage-resistant paneling and wainscoting.



4. Good-looking wardrobes and storage lockers.



5. Inexpensive, easy-to-build screens, movable partitions.

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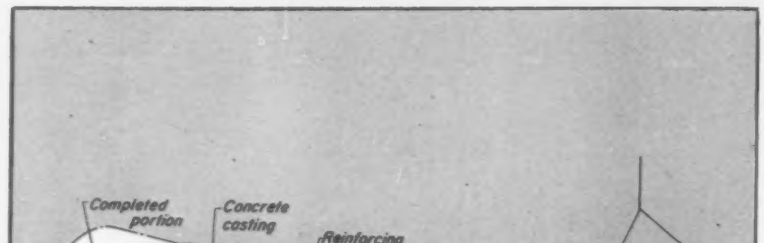
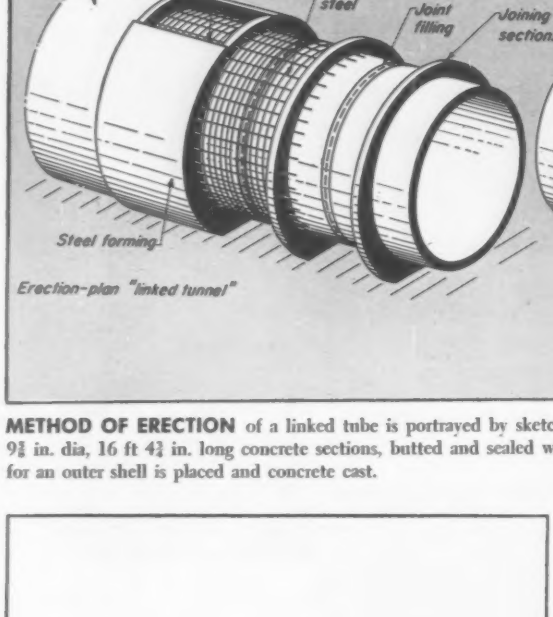
Low Cost Is Promised With Dutch "Linked Tun

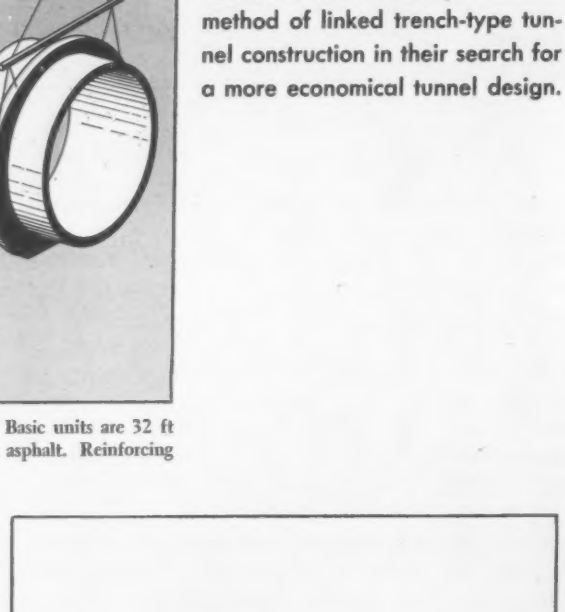


Using manageable basic sections of reinforced concrete tubing, members of The Central Netherland Council of Applied Scientific Research, have developed a new method of linked trench-type tunnel construction in their search for a more economical tunnel design.

METHOD OF ERECTION of a linked tube is portrayed by sketch. Basic units are 32 ft 9¾ in. dia, 16 ft 4¾ in. long concrete sections, butted and sealed with asphalt. Reinforcing for an outer shell is placed and concrete cast.



FLOATING TRUSSES support the tunnel sections which are lowered to the bottom as sink-weight is added in the form of . . .



BALLAST GRAVEL. Upon reaching bottom, sand is packed under the tubes and into the space between the sections.

d Tunnel"

A new method of trench-type tunnel construction—using linked concrete sections—has been developed in Holland. It promises to cut construction costs, and yet maintain the static advantages of U. S.-developed circular-section tunnel designs.

Claimed advantages are: Less use of structural steel; construction and erection of easily-handled sections indoors, and easier, cheaper transportation to the site.

Called a "linked" tunnel by its designers, the assembly consists of a thin-walled prestressed inner tube which is coated with bitumen, and an outside cover section varying in thickness up to 3 ft 3⅜ in.

The 6 in. thin-walled inner section is prefabricated. It is cast and prestressed vertically in 16 ft 4¾ in. long units and painted with asphalt. A reinforced concrete ring is also cast about the center of the unit, to act as form edges for the outer concrete. The rings also serve as a protective bumper during transportation. Because the core units are relatively small, all work on them can be done indoors.

After fabrication on an "assembly line" the core units are turned 90 deg and butted together; the joints filled with a reinforced asphalt filler then reinforcing steel for the outer coating is erected and fitted, the longitudinal rods being placed through holes drilled in the precast rings. The 16 by 4¾ in. wide compartments between these rings are filled with concrete. This is repeated with each subsequent section until a tunnel section of approximately 262 ft is formed.

• **Placing**—The built-up section is now ready to be floated. A layer of ballast concrete is placed into the bottom of the tunnel section, reached through manholes. The ballast is separated from the inner tube by a thin asphalt layer, and serves as a base for the traffic loads and inside construction which will start after the tunnel is sunk. For a four-lane tunnel, two single tunnel sections are coupled with a square flange of reinforced concrete. A clearance of 3 ft 3 in. is maintained between the coupled sections.

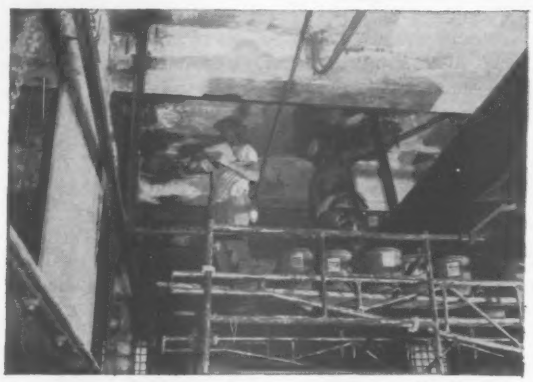
The assembled sections are bulkheaded and towed to the site, above a dredged trench, and cables from derricks or barges guide the section downward as weight is added, in a manner that has become conventional in U. S.-type sunk-in-place tubes.

Immediately after the sinking and filling, water pressure will affect the outer concrete, but after some time—

How THORITE and THOROSEAL made this underground structure sound again!

Workmen prepare old surface for patching with THORITE.

Water has entered the concrete and caused corrosion of reinforcing rods, blistering the concrete off surface and causing structural weakness throughout building.



Reinforcing was cleaned, all corrosion was removed and brush coat of THORITE applied over entire patching area, then filled in with trowel coats of THORITE, even with surrounding surfaces.

THORITE Patching Mortar sets in 20 to 30 minutes and can be coated with THOROSEAL while hardening.

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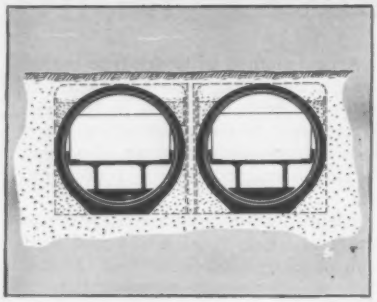
. . . Linked tunnel



THE CONCRETE TUNNEL is eventually buried in the river bottom ditch with the addition of cover sand.

depending on the thickness—the water will reach the asphalt layer and bring pressure to bear on the inner tube. Consequently the diameter of this tube will become smaller, and a narrow water-filled wedge between the outer layer and the asphalt layer will result.

To prevent undesirable bending conditions at the rings, the dowels which form the link between the inner tube and the rings are designed so that they transmit stress tangentially only. Radially they allow free movement.

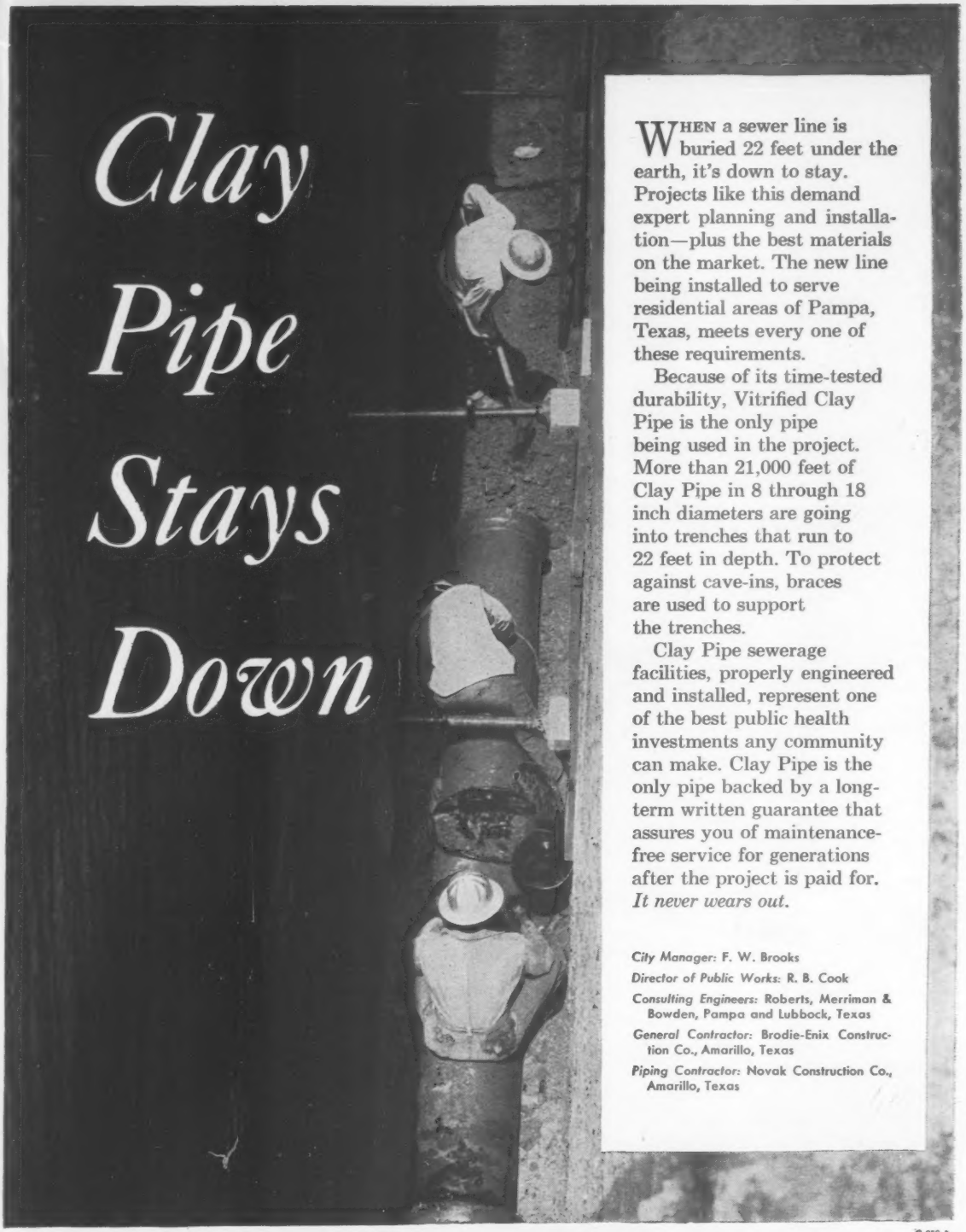
Because of water pressure and its own weight, the inner tube is in a position of membrane tension. The shear tensions are small, and are compensated by the two pressure stresses—tangentially from water pressure and longitudinally from prestressing. Since the separate sections are allowed to shrink or expand freely, the difference of temperature will not cause cracks, and with the asphalt layer providing extra security, the inner tube is sufficiently waterproof. The conical cross-section of the rings, constituting a prefabricated part of the outer layer, are said to prevent shrinkage seams on the connecting planes.

Lengthwise, the outer layer is rather slack. If settlement differences occur, the reinforcing steel will slide at the rings since the concrete on either side of the rings will undergo angular displacements. These are, however, very small, and will not affect the inner tube.

• **Costs and credits**—A four-lane linked tunnel is estimated to cost $6,053 per 3 ft 3⅜ in. (meter) against $7,994 for a square shaped tunnel, and $10,526 for the round American type.

Roadway to tunnel top clearance is 18 ft 8¼ in. with a square tunnel and 22 ft. 3⅜ in. with a linked tunnel.

Investigations are being made at the Central Netherland Council of Applied Scientific Research at Delft, near The Hague. Tensions and pressures which may occur, not yet found, are being studied.



Clay Pipe Stays Down

WHEN a sewer line is buried 22 feet under the earth, it's down to stay. Projects like this demand expert planning and installation—plus the best materials on the market. The new line being installed to serve residential areas of Pampa, Texas, meets every one of these requirements.

Because of its time-tested durability, Vitrified Clay Pipe is the only pipe being used in the project. More than 21,000 feet of Clay Pipe in 8 through 18 inch diameters are going into trenches that run to 22 feet in depth. To protect against cave-ins, braces are used to support the trenches.

Clay Pipe sewerage facilities, properly engineered and installed, represent one of the best public health investments any community can make. Clay Pipe is the only pipe backed by a long-term written guarantee that assures you of maintenance-free service for generations after the project is paid for. *It never wears out.*

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Director of Public Works: R. B. Cook

Consulting Engineers: Roberts, Merriman & Bowden, Pampa and Lubbock, Texas

General Contractor: Brodie-Enix Construction Co., Amarillo, Texas

Piping Contractor: Novak Construction Co., Amarillo, Texas

C-256-1

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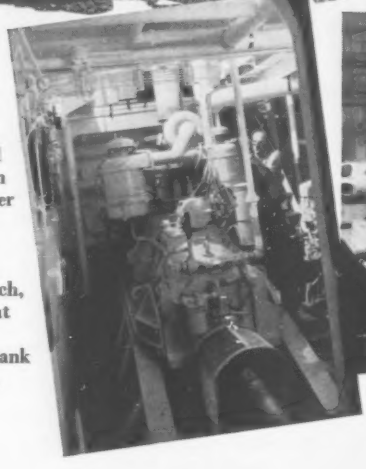
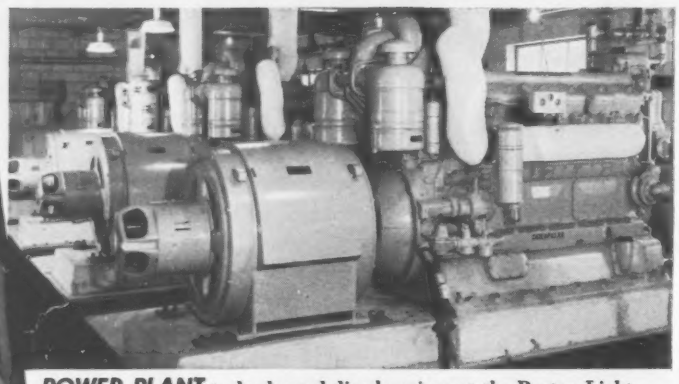


MARINE turbocharged diesel engines in the inland river towboat, *Papa Guy*, are rated at 490 horsepower each, allow the boat to tow two 20,000-barrel tank barges per trip.



POWER PLANT turbocharged diesel engines at the Barton Light and Power Plant in Vermont raise output more than 25% while decreasing fuel per horsepower hour, noise and smoke.

In every diesel application, AiResearch turbochargers have improved engine performance to an outstanding degree. The exceptional efficiency of their basic design and turbine wheels makes them the finest in the industry. They provide the following advantages: increased power up to 100% depending on engine design and application; lower specific fuel consumption; lower engine thermal loading and less smoke and noise. AiResearch turbochargers are air cooled, eliminating additional load on the cooling system and also eliminating complicated plumbing. Experience with thousands of units in the field proves their extreme reliability and durability.

• *Your inquiries are invited.*

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AiResearch Industrial Division

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Spreader-box Is Adjustable While in Motion

A special-purpose base spreader box is equipped with front lift wheels that are adjustable while the paver is in forward motion.

The manufacturer says that while the box is designed for spreading cement-treated or crusher run base stone, it is equally suited to asphaltic mixes.

The lift wheels are raised or lowered independently to lay passes from ½ in. to 8 in. deep or deeper, either in uniform or tapered pass thickness, and may be used to overlap a previous pass even when one wheel rides up on material from that pass.

According to the manufacturer, the spreader is able to lay base materials at the rate of 200 yd per hour. CREATIVE METALS CORP., 1290 POWELL ST., EMERYVILLE, CALIF.

Money-Saving Suction Pipe For Construction Industry

Cutting nearly 90 cents off every dollar of cost per foot of suction line now is possible with a new lightweight industrial suction pipe, according to W. R. Ames Co., Milpitas, Calif.

This equipment can be adapted to almost any use in construction activity, by employing any of the wide variety of available fittings. These include: suction pump connections, check and foot valves, pressure and suction gauges, elbows, tees, plugs, caps and in-line and hydrant type valves.

A "V" type suction gasket at each coupling junction allows an 11 deg off center movement in any direction without breaking the suction seal.

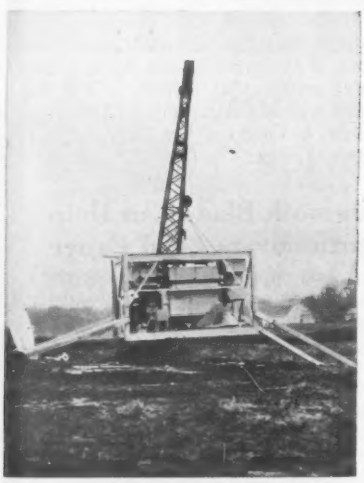
No Chemical Mixing With New Photocopier

A continuous photocopier, known as the Contoura-Matic, has been announced..

Its main feature is an airtight plastic cartridge in which the processing liquid is premixed.

With this innovation the cartridge is snapped into place so that it pours automatically. The exhausted developer is disposed of within the same container.

(*Continued on page 62*)



Support columns are hinged . . .

Bin section is added to top . . .

And the rig is ready for work.

This Batcher Can Be Set Up or Taken Down in Hours

The HP-85 is an easily dismantled concrete plant that can be taken down and set up at a new site in a matter of hours. And—according to the manufacturer—it has a production capacity ranging up to 200 cu yd per hour.

The plant is automatic and may be operated by one man, or if the situation permits, the batching can be handled by truck drivers operating the push button controls located at ground level. Butler Bin Co., Waukesha, Wis.

The 12 lb machine is said to be the smallest and lightest on the market—15 in. wide by 6 in. deep.

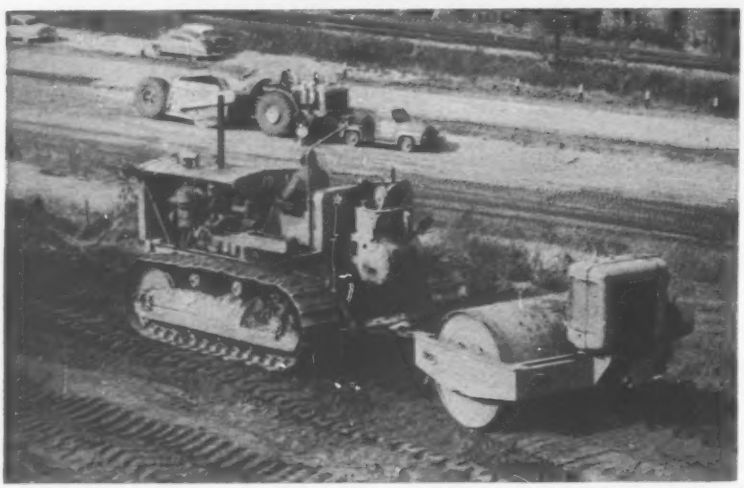
According to the manufacturer, it makes four photo-exact copies per minute on white, colored or transparent paper. It copies any mark on any paper, including writing, drawing, printing, red and colored inks, mimeo and even spirit duplicator. F. G. Ludwig, Inc., Dept. C-M, 105 Coulter St., Old Saybrook, Conn.

Erect-it-Yourself Buildings Packaged

An all-steel pole-type industrial utility building of "do-it-yourself" construction is being sold as a structural package for as low as 70 cents per sq ft. This building line, called Stran-Master, is now available in widths of 12 to 120 ft, and in lengths in multiples of 16 ft.

This low-profile building has a peak roof. The windows and doors can be placed anywhere. It is constructed of 3 ft wide panels and adjustable columns and girts. If desired, the building can be ordered without walls.

No cranes or heavy equipment are needed for erection. A 36 x 72 ft building can be put up by an unskilled maintenance crew in 180 to 200 hours, according to the manufacturer. Key to the easy erection is an exclusive self-leveling structural feature, an adjustable telescoping arrangement of the steel columns. Stran-Steel Corp., Detroit 29, Mich.



Tow-Type, Big Tonnage Vibratory Compactor

A tow-type vibratory roller for grade, base and surface consolidation, the Bros Vibra-Pactor features a static weight of 4½ tons and a controlled variable vibratory force equal to a range from 7½ to 10½ tons.

According to the manufacturer, its vibratory frequency range is 1,100 to 1,300 vibrations per minute. With each revolution the drum is raised from the ground ¾ in. This impact force combined with the drum weight helps produce desired density.

The machine is powered by a 40 hp gasoline engine, and has a 48 in. dia drum with a rolling width of 66 in. It is also available with a deisel engine. Bros Inc., Road Machinery Div., 1057 Tenth Ave. S.E., Minneapolis 14, Minn.

Straight-Edge Detector Comes in Longer Models

Longer models of an easy-rolling straight-edge that detects and marks areas not within specification limits on concrete slabs and forms now is available.

In addition to the original 10 ft model, the Hi-Lo Detector is being offered in 12 and 16 ft lengths.

The Hi-Lo is simply rolled along highways or runways with a floating center wheel detecting high or low spots. A dye-marking attachment, controlled by the operator, marks high or low spots as the operator comes to them.

A new sounding device also is available, which causes high spots to ring a bell and low spots to sound a buzzer. Viking Manufacturing Co., Manhattan, Kan.

Forty-Ton Truck Crane Rides Outriggers

The American 500 Series, an air-controlled 40-ton capacity truck crane, is equipped with a new outrigger system that, according to the manufacturer, permits substantial rate reductions in the carrier while providing a solid foundation at five points for the crane.

The outrigger system features deep center sections that swing out from the carrier (rather than sliding out) and lock into position. These sections are slightly longer than ordinary outriggers and are located almost directly under the rotating base of the machine. Two outriggers at the rear and one at the front of the machine add up to a five-point system that permits a 360 deg swing with rated capacities. American Hoist & Derrick Co., St. Paul 1, Minn.

Sawtooth Blade Can Help Earthmovers Load Faster

A new type cutting edge for earthmoving equipment features angled, chisel-shaped teeth.

With this design, only a minimum of blade area is required for initial contact; less impact and more "digging in" are the result. Further, actual yardage within the scraper bowl is possible because the blade breaks up the material, eliminating large voids.

Power requirements for scraper operation are reduced, and in some cases where a scraper normally requires push-loading, the scraper with the new blade is said to be able to do it alone.

Still another advantage claimed is that the blade crumbles material and thus improves the spread pattern and

a 200-lb. portable digital computer that can solve your problems where they happen

It may be a highway construction job . . . an oil exploration . . . an aerial survey. Wherever your problems happen—in the field, office, or lab—Recomp can solve them on the spot. Recomp's all-transistor design makes it the first general-purpose digital computer that's so lightweight, compact, rugged it can travel anywhere.

But Recomp is no lightweight when it comes to performance. It solves the same kind of scientific analysis, data reduction, and business problems that the gigantic vacuum-tube machines solve. And it can out-perform any computer in its price range.

For example, in just 5 minutes Recomp can solve bridge design problems that would take 40 man-hours by standard methods. Recomp can also figure cut and fill, borrow-pit, traffic analysis and simulation, roadway design, grade profile, and drainage problems in just a fraction of the time formerly required. The construction bid itself can be prepared faster and more accurately than ever. And even though Recomp solves the most complex problems, it is remarkably simple to operate. Semi-skilled personnel can learn how in a few hours.

Recomp provides a level of reliability unobtainable in any other computer. Its transistorized etched circuits are mounted on plug-in cards. There are only a few types of cards, and they are easy to replace if servicing is required. Service is available throughout the U.S.

Recomp doesn't require a special air-conditioned room. Plug it into any 115-volt outlet . . . power it with a field generator. It uses less current than a toaster.

For complete details, prices, and brochure, write Marketing Director, Autonetics, Dept. R-21, 9150 E. Imperial Highway, Downey, California.

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A DIVISION OF NORTH AMERICAN AVIATION, INC.

10 QUESTIONS everyhig

beforesta

Can you answer all 10?

1. What types of accidents are most likely to occur on a highway project?
2. How do you plan for safety?
3. Is a safety policy necessary?
4. What is a most important objective of an accident investigation?
5. What signs are required to protect the public?
6. What about detours and barricades, adequate and safe provisions for moving traffic adjacent to work areas?
7. What procedures are important to safely control clearing rock and earth excavation problems?
8. What safety equipment should be used by highway workers?
9. Is provision for first aid desirable?
10. How should job vehicles be kept under control? What about safety of equipment at the site when not in use?

ry highway contractor should answer restarting any job! by MR. FRIENDLY*

Easily installed, simple-to-operate safety programs result in more profits on any project . . . more successful bids, too!

Successful contractors know that on any contract keeping costs within the original estimate is a key factor in completing the job satisfactorily.

Eliminating accidents is not only one of the surest ways to keep costs in line but also helps to keep bids low, and assures completion of contracts on time to help maintain a firm's reputation for reliability.

Knowing the answers to the 10 questions listed here and putting them into practice can assure any contractor of the benefits to be derived from an adequate safety program.

For many years, American Mutual has helped highway contractors with safety problems. This includes an unsurpassed safety engineering service which can cut accidents to a minimum and reduce insurance costs, a claim service that's prompt and fair and an outstanding rehabilitation service for workers who may be unavoidably injured.

Mr. Friendly's book gives the answers!

A note on your company letterhead sent to the address below will bring you a free copy of "SURFACE CONSTRUCTION WITHOUT ACCIDENTS." It's a comprehensive, illustrated, easy-to-read little book that can provide the key to the answer to any of the 10 questions herein. Just write to: American Mutual Liability Insurance Company, Dept. EN-1, 142 Berkely Street, Boston 16, Mass.

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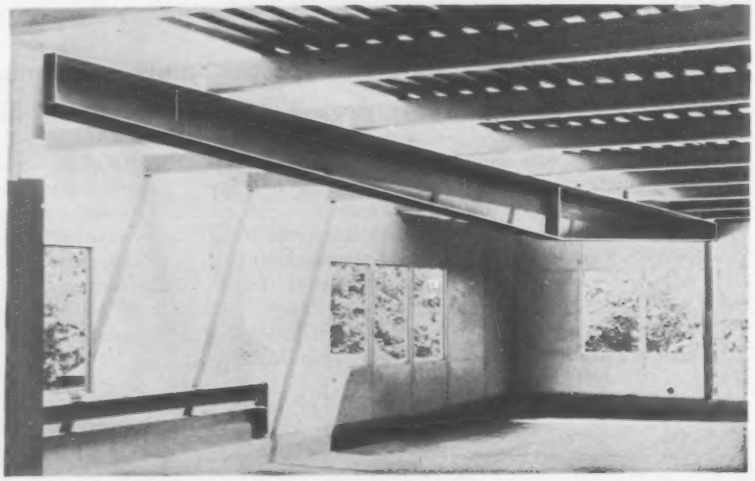
permits faster discharge from the bowl. The "Twistooth" cutter-blade comes in predrilled sections and can be used for a variety of equipment including bulldozers, graders, and tractor-shovels. SHUNK MFG. CO., BUCYRUS, OHIO.



Tapered Beams Form New Roofing System

Sloped beams, fabricated of welded steel plate, in standard depths and spans are the basis of a new roofing system for low profile buildings.

The beams taper from heel depths of 8 to 13 in. to centerline depths of 16 to 30 in. One flange of the beam is straight while the opposite flange tapers. Flat or low sloping roofs can be obtained by using the proper beam flange.

The Slope-Beam system is a complete framing-unit package, including the sloped beam and steel purlins to be used with most types of roof decks.

The beams are available in a variety of sizes for spans from 25 to 60 ft. They can be made to any length at no cost increase. Purlins are available in sizes 8 to 10 in. deep.

The system can be designed for multiple spans, inverted positioning, longitudinal tilting, overhangs and special loadings. STEELCRAFT MANUFACTURING CO., 9017 BLUE ASH ROAD, CINCINNATI 42, OHIO.

Built-In Ties Speed Insulation Fastening

No. 101 pipe insulation—a covering suited for nested pipes and steam traced lines — consists of moisture resistant spun mineral wool that will withstand temperatures to 1,200 F, according to the manufacturer.

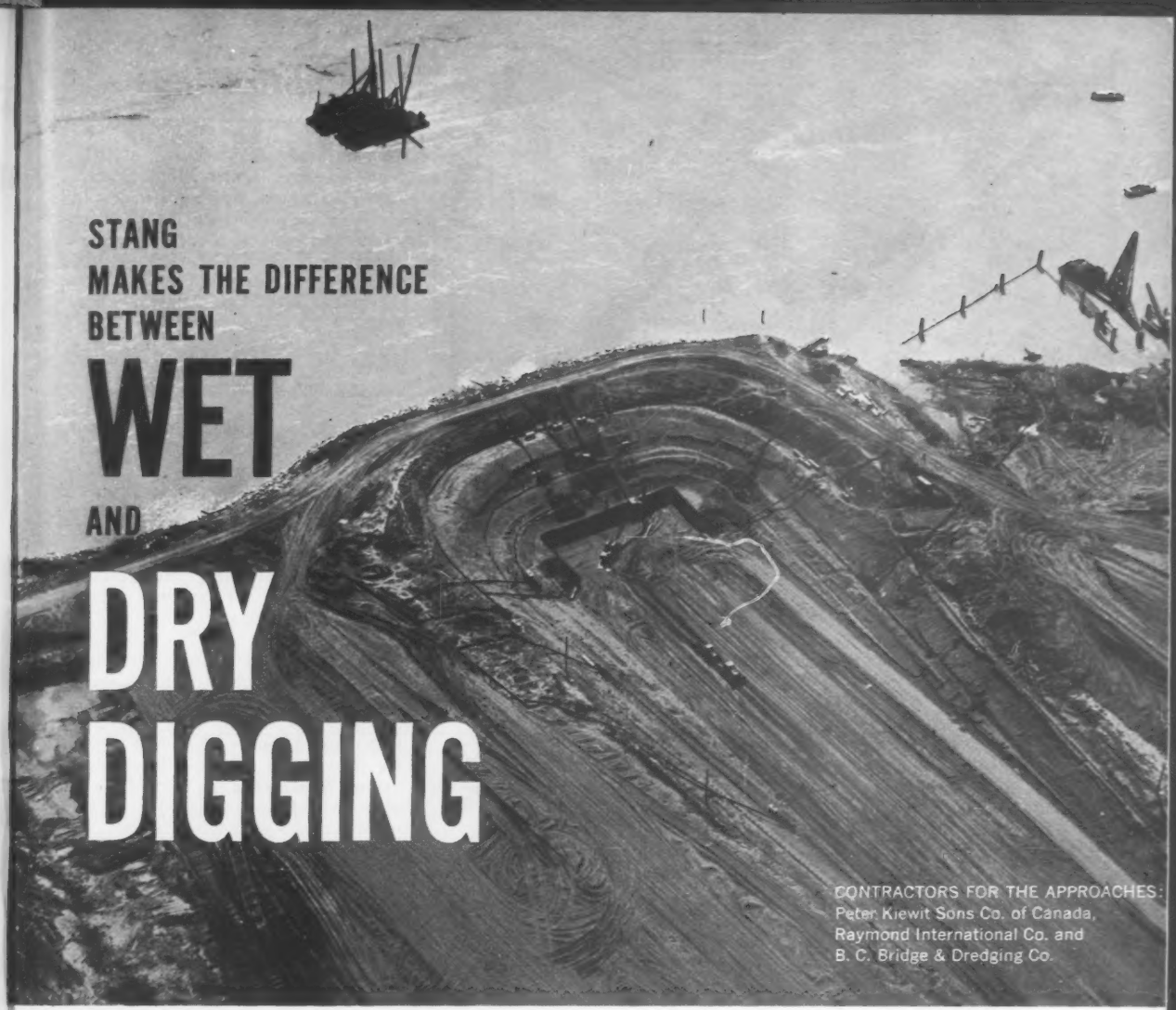
Its exterior surface is faced with a metal fabric of 16 gage wires welded in a 2 x 2⅜ in. rectangular mesh and held in place by 16 gage wires tied through the spun wool to an inner facing of 1 in. expanded metal lath.

Fast installation can be accomplished by hooking wires that extend from one end of the outer mesh fabric under the opposite stay wire and bending them over and back.

The new material is specifically designed for runs of pipe that are to be weatherproofed with sheet metal or roofing felt.

The insulation is available in 2 ft sections, 1½ to 4 in. thick for pipe sizes

ranging in diameters from 4 to 30 in. ENGINEERING DEPT., BALDWIN-HILL CO., 500 BREUNIG AVE., TRENTON, N. J.



Deas Island Tunnel approaches DUG IN THE DRY—thanks to Stang dewatering

Taking the initial step in construction of Canada's first subaqueous highway tunnel, which joins Deas and Lulu islands in the province of British Columbia, contractors for the approaches to the Frazer River called for dewatering by the John W. Stang Corporation. In record time, Stang engineers designed and had operating a deepwell turbine system on the Deas Island side and a wellpoint system on the Lulu Island side, making the excavations on both island approaches COMPLETELY DRY TO A DEPTH OF FIFTY FEET, AT THE VERY EDGE OF THE RIVER.

On any project, you can depend on Stang to start the job right—IN THE DRY. Remember, the responsible handling of water, in any situation, is Stang's sole business. Don't fight water, and lose time and money doing it. For the practical, economical answer to all your water problems, call on water-handling specialists . . . call on STANG!

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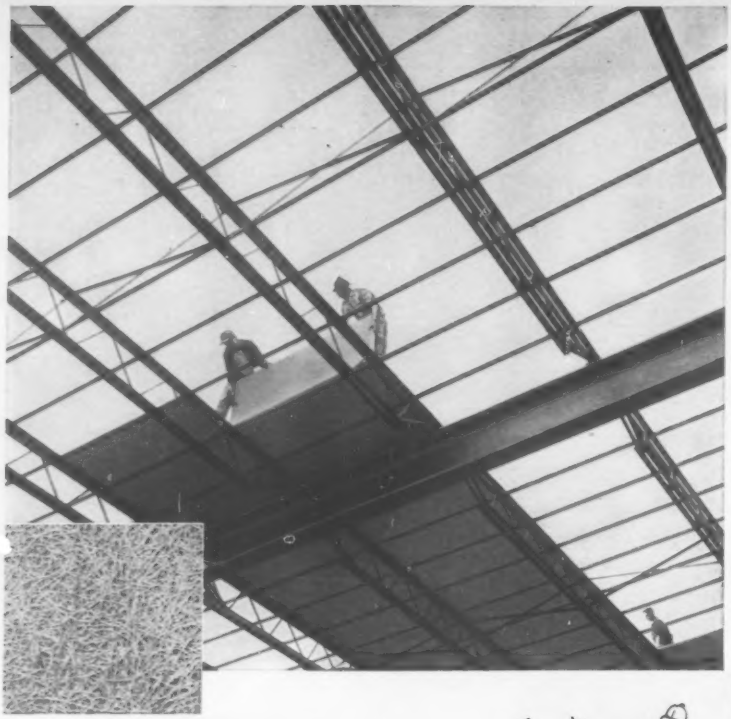

DOWN GOES THE CEILING . . .

This is a Tectum roof deck going into place, and as you can see, a lot of surface gets covered in a day's time. And when the deck's down, the ceiling inside the building is finished. Tectum with felt-backing membrane on the outside—finished textured surface on the inside—makes deck and ceiling a single material cost—a single material installation. This is real cost saving; this is the way schools, churches, industrial plants, motels, shopping centers, stores, and residences are keeping costs in line with appropriated funds—and doing it attractively and quickly. Have you investigated versatile Tectum? Ideal for roof decks, sidewall panels and suspended acoustical ceilings. A new additional plant gives you more Tectum now than ever before. Send for complete information, today.

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Branch Offices in Philadelphia, Columbus, Atlanta, Dallas, Chicago, Beverly Hills, Seattle, and Toronto, with distributors in all leading areas. Factories in Newark, O., and Arkadelphia, Ark.

Publications

Attachments—Accessories and Attachments for Allis-Chalmers Motor Graders (MS-1161) is a four-page folder in which extra equipment is described for owners and users of Models 45 and D motor graders. CONSTRUCTION MACHINERY DIV., TRACTOR GROUP, ALLIS-CHALMERS MFG. CO., MILWAUKEE 1, WIS.

Slurry pump—Morris Machine Works has prepared Bulletin 185 describing capacities and the applications of its heavy-duty low-speed RX slurry pump for cement, sand, coal, solids and the like. MORRIS MACHINE WORKS, BALDWINSVILLE, N. Y.

Fork trucks—Tips on operating fork lift trucks more safely are contained in an 8 page, two-color folder available now. LEWIS-SHEPARD PRODUCTS, INC., WATERTOWN, MASS.

Safety—Safety engineers and purchasing agents for construction, utility, railroad and other firms will find the material of interest in a four-page illustrated folder describing the assortment of winter liners for all protective hats. MINE SAFETY APPLIANCES CO., 201 N. BRADDOCK AVE., PITTSBURGH 8, PA.

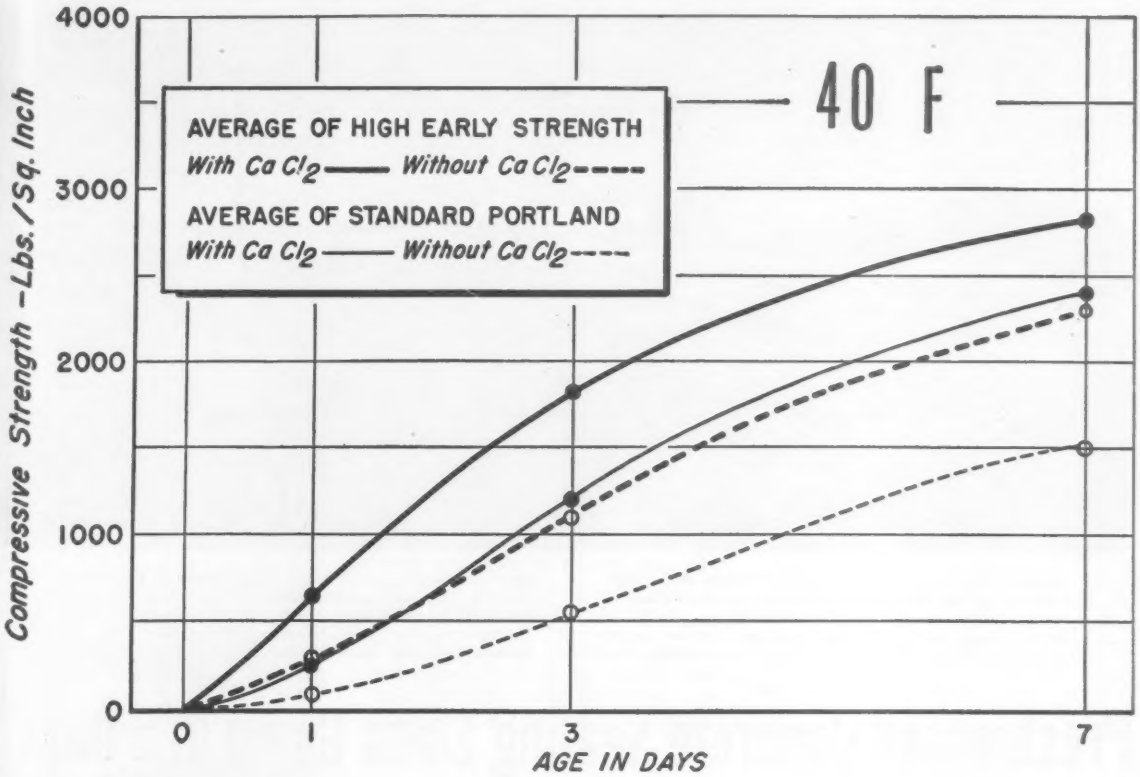
Wood—How to Specify and Use Pressure Treated Wood for Highways is the title of a new eight-page booklet. It presents basic specification requirements for each major highway use. AMERICAN WOOD PRESERVERS INSTITUTE, 111 W. WASHINGTON ST., CHICAGO 2, ILL.

Asphalt plants—A folder for contractors, inspectors, highway engineers and engineering students, entitled "Principles of Barber-Greene Continuous Asphalt Plants", is available now. Some 13 pages are devoted to graphic demonstrations of how a continuous asphalt plant operates. BARBER-GREENE CO., 400 N. HIGHLAND AVE., AURORA, ILL.

• **Expansion joints**—A basic text on the design, construction and maintenance of joints in concrete pavements, with particular emphasis on the needs for safety, economy and durability, is contained in a 23 page booklet, "Design Practices and Uses of Premoulded Joints in Concrete Pavements." The booklet is a companion piece to "Sealing of Joints and Cracks in Concrete and Bituminous Pavements," published by the Joint Sealer Manufacturers' Association. The new work is available from The Expansion Joint Institute, 121 Hill Ave., Aurora, Ill.

NO WINTER SLOW-DOWN HERE

COLUMBIA CALCIUM CHLORIDE gives high early strength days faster



Low winter temperatures shouldn't put a chill on your concrete schedules. Pours can go smoothly, set time be shortened safely, finishing done without delay or overtime. How come? Columbia Calcium Chloride comes . . . right in the ready mix.

The American Concrete Institute now recommends the addition of calcium chloride for cold weather concreting. (ACI Standard "Recommended Practice for Winter Concreting.") These benefits have been proved, on jobsite after jobsite: initial and final set achieved up to three times faster, quicker early strength, greater ultimate strength. Finishing goes faster, forms can be pulled days earlier, contractor profit increases.

Let our Columbia Calcium Chloride engineers help you save money on your concrete work this season. For their assistance, just write today to Calcium Chloride Department at our Pittsburgh address, or to any of our fourteen conveniently located District Sales Offices.

Columbia Calcium Chloride is available in both High Test Flake (94-97% $CaCl_2$ content) and Regular Flake (77-80% $CaCl_2$). One 80 lb. bag of High Test delivers the same results as one 100 lb. bag of Regular. Both add easily at suppliers' plants or right at the jobsite.

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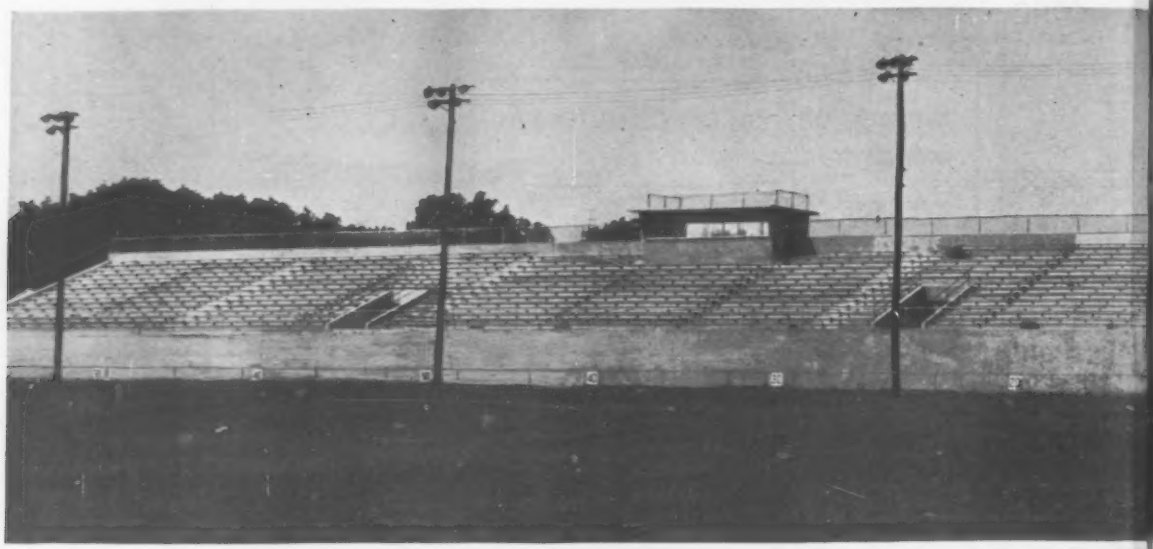

Anderson Field Stadium in Fort Valley, Georgia. Manufacture and erection of this 2900-seat stadium was performed by Macon Prestressed Concrete Company, Macon, Ga. 7/16" Union Tufwire strand was used exclusively in the stadium slabs, which were erected in less than 5 days working time.

Owner of the structure is Peach County Board of Education, Ernest R. Anderson, superintendent.
Architects: Warren & Riley, Macon, Ga.
Structural Engineer: W. H. Armstrong, Macon, Ga.
General Contractor: Homer Davis, Ft. Valley, Ga.

Prestressed Concrete Seating Slabs Go Up In 5 Days

Ever watched a circus crew race against time to set up the seats before the ticket window opened? Concrete stadiums go up these days with comparable speed — thanks to prestressed concrete.

While the supporting stringers were being erected on the site, the Macon Prestressed Concrete Company cast and prestressed the special seating slabs for the Anderson Field Stadium, Ft. Valley, Ga. In just 5 days, the slabs were set in place ready to attach seats for 2900 sports fans.

This project is another demonstration of the adaptability of prestressed concrete. Here are a few of the many other prestressed concrete products in wide use: I beams, T purlins, tilt-up and tongue-and-groove siding; channel panels and slabs for floors and roofs; pipe and tanks; fence and lamp posts; highway and airport slabs; bridge and wharf piling; slabs, stringers and girders; complete warehouses, shopping centers, stadiums, gymnasiums, schools and commercial and industrial buildings. Experimental work of utmost promise is now under way on highway slabs.

Easy, fast transportability of prestressed structural members is a big advantage of prestressing. Here the stadium seating slabs are being hoisted from truck to position on the stadium stringers.

the Big Game

Savings in time and labor are pointed up by this view of slab being hoisted into place. No forms to build, no waiting on the weather nor materials in short supply.

Here is a close-up view of the completed stadium, erected in record time to add another laurel to the achievements of prestressed concrete. The strength and resilience of the prestressed seating slabs provides a high safety factor for the combination of load and vibration imposed by excited fans.

"The New Age of Concrete": What Will It Mean to You?

The construction industry has fielded a team that compares in speed with old methods like a 50-yard pass outstrips the slow advance of a ground attack.

The "team" is prestressed concrete construction. And speed is just one of the features that make it today's miracle building material, with a future unlimited.

Reporting on the recent progress in prestressed concrete, the Concrete Industries Year Book, 1957, says:

"In less than a mere half-dozen years prestressed concrete has grown from nothing to a building material which must be reckoned with in all construction in the future."

Here are some of the reasons why the industry has grown at rates of from 200% to 300% per year.

Prestressing increases tensile strength of concrete many fold. Less concrete and less steel are needed. Strength-to-weight ratio is high. Longer spans and thinner sections are possible. Prestressing combines the permanence of concrete with amazing flexibility and elimination of cracking. The savings it makes in time and money mean more profit for suppliers and constructors — greater value for owners and taxpayers.

Prestressing offers you big opportunities whether you use it as an on-site contractor with portable prestressing beds, or become a permanent site fabricator of concrete products of any description. And our own engineers will work closely with you or your consulting engineer on your stress-relieved wire and strand specifications.

Today Union Wire Rope Corporation is supplying the mounting demands for Tufwire high tensile wire and strand with on-schedule speed and dependability. And we're gearing to future needs — with technical know-how, expanding production facilities and research.

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Truck-mounted A-W Hydraulic Crane Equipped with ½-yd. concrete bucket shown working on job for Western Gravel Co.

A-W Hydraulic Crane shows versatility at Western Gravel Co. plant

Western Gravel Company, Campbell, Calif., produces rock, sand and gravel and also sells Redi-mix concrete, made in two fully automatic batch plants. More than a year ago, this company bought an Austin-Western Hydraulic Crane unit for work in its own yard and to rent to customers. Mounted on a 6-wheel Army truck which has a platform large enough to transport a ½-yd. concrete bucket or a ⅜-yd. clamshell bucket, the crane has an 18-ft. extensible boom with a 17-ft. manual extension. Four hydraulic outriggers are used to give extra stability on heavy lifts.

Saves downtime of batch plant. Western Gravel reports: "Downtime of one of our batch plants not only costs the loss of the plant's production, but we lose the value of perhaps 10 of our Redi-mix trucks, worth $8 an hour apiece. Not only this, but our contractor-customers may suffer because gangs on the jobs are idle and there are also equipment rental losses. These losses may easily snowball into $300 an hour. Using the A-W, we can now change heavy motors on the plant in 30 minutes, an hour less than formerly. The value of this one hour saved might equal a month's cost of owning the A-W."

Popular with customers. "On most jobs, when a contractor rents a large crane he has to pay the moving cost and setup time for many more hours than he pays for renting our lower-rate A-W, which goes and comes so much faster and is ready to work minutes after it arrives."

Extremely versatile. "We used the crane to assemble our second batch plant. It lifts engines out of earth-moving machines and tractors... hoists sacks of admixtures up 20 ft. to floor of batch plant.... In our operation there seems to be nothing it cannot do to save time and labor in lifting things."

For the complete Western Gravel Co. story, write for Gould Certified Report No. 5601.

Austin-Western CONSTRUCTION EQUIPMENT DIVISION, AURORA, ILL.

BALDWIN · LIMA · HAMILTON

Power graders • Motor sweepers • Road rollers • Hydraulic cranes

BALDWIN BLH LIMA-HAMILTON

NEW RUNWAY for Hong Kong's jet-age airport extends into Kowloon Harbor (arrow) some 8,000 ft. Mountains skirting the harbor have made landings and takeoffs treacherous operations.

Hong Kong Readies for the Jet Age

A U. S. airline pilot aptly said of Hong Kong's sole civil airport: "There's just no room for error. If you're wrong—you're dead wrong."

Any way you look at it, landing at Hong Kong is a supreme test of airmanship. The same sheltering hills that make the Colony one of the world's finest natural harbors pocket the Kai Tak Airport to make navigation to and from its two short (4,750 ft and 5,460 ft) dead-ended runways notoriously difficult.

To change all this for the coming commercial jet age, the government has taken big steps: in January, 1955, it let a $16.1 million contract—the first stage of an ultimate $18.3 million program and the largest single civil engineering contract in its history.

The result will be an 8,340 ft runway with a parallel taxiway stretching from Kowloon Harbor, and an airport capable of taking the largest jet airliners so far designed. The new runway is scheduled for operation by August, 1958; the terminal, maintenance and administration areas will be built on the site of the current runways and will be in operation a year later.

Two of the three leveling operations required to permit a 1 in 40 approach gradient for planes over the Kowloon mainland have been both a personal and a physical engineering problem to consulting engineers Scott & Wilson, Kirkpatrick & Partners, London, and principal sub-contractors, Gammon (Malaya) Ltd.

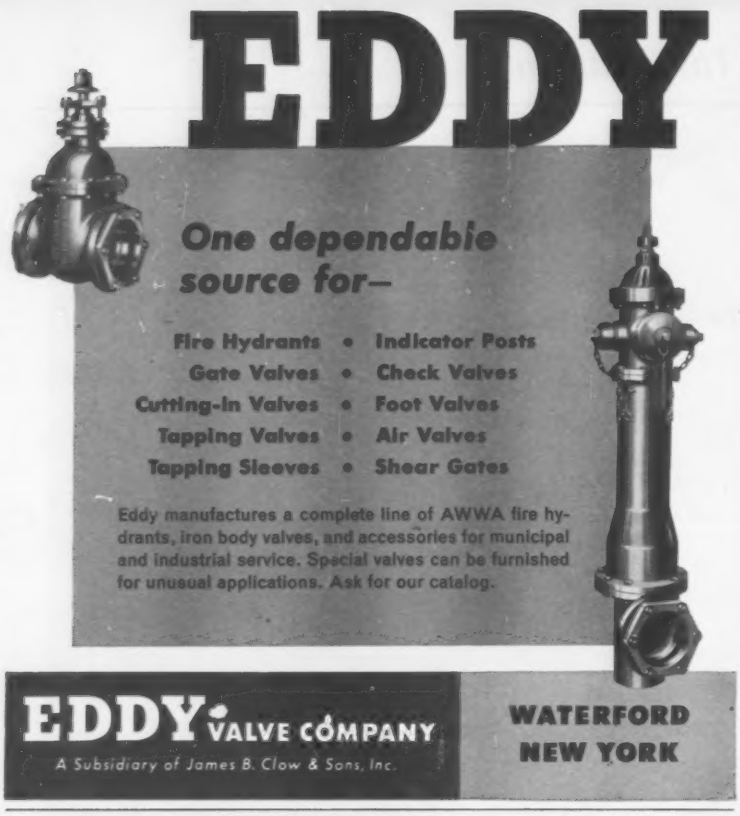
Lowering the Kowloon Hills by 150 ft provided 2½ million cu yd of fill for the required land reclamation. But new apartments will have to be built to compensate the owners for the scheduled razing of three recently constructed 10 story buildings that jut 286 ft into the path of approaching aircraft. And, to level the 109 ft Sacred Hill of Sung, which stood on the landward side of the proposed runway, the contractors first had to remove a 30 ton block from the hill and set it up in a specially built park to propitiate the memory of the last king of the Sung dynasty, Ti Ping.

Engineers report that reclamation of some 162 acres, dredging of about 10 million cu yd and construction of 5,400 yd of sea wall is proceeding satisfactorily although slowed somewhat by the appearance of a highly abrasive sand.

Constructed of flexible pavement, with an asphalt surfacing overlaying a densely graded crushed-stone base course, the runway is designed for the worst condition produced by either of two loadings: 60,000 lb on a single wheel with tire pressure of 250 psi, and 16,000 lb on dual-tandem wheels with the same tire pressure.

German Firm to Help Build Aluminum Plant in India

German capital and technical assistance will help build a 10,000 ton aluminum plant at Rihand in the Indian state of Uttar Pradesh. According to a Bombay representative of Birlas Bros., the Indian company is completing an agreement with a "well-known" German firm, the latter to provide technical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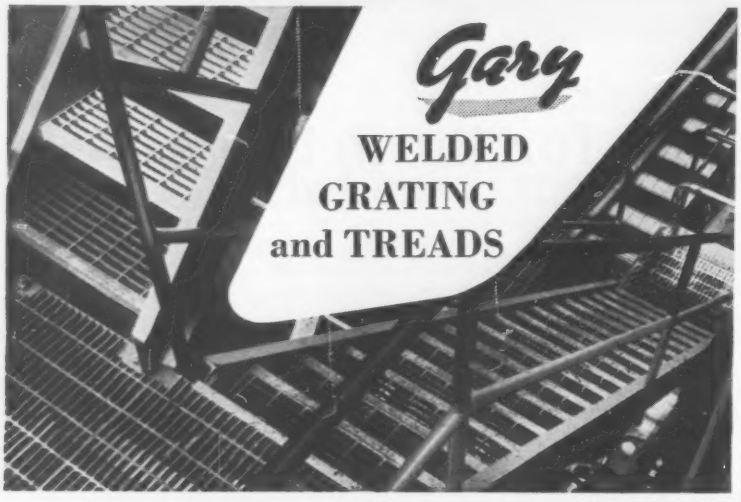

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- **OPEN CONSTRUCTION**—gives maximum ventilation and illumination. Ask for Bulletin E-18

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assistance, foreign exchange (with the consent of the Bonn government), and machinery.

The Birlas firm will enter into partnership with the German company, the identity of which for the time being is being withheld.

New Delhi officials expect the Rihand plant to become the biggest of its kind in the country. Its ultimate capacity may reach 45,000 tons a year, provided the dam and power network being constructed in the same area—with the aid of U.S. money—can supply enough power.

Another aluminum expansion in India is the $18 million program of Indian Aluminum Co., which has Aluminum Co. of Montreal as a major partner. The expansion, now under way, includes construction of an aluminum smelter of 10,000 ton capacity at Orissa, near the Hirakud Dam.

Power Program Planned For Argentine Interior

The Argentine Planning Commission for Hydro-Electric Power Plants has announced construction plans for hydroelectric power plants through 1965 at a cost of $500 million.

Plans call for reducing and eventually eliminating the yearly $50 million fuel import expenses for thermo-electric plants, which is expected to double when plants now under construction are in operation.

The commission reported that at present only 62% of Argentina's population benefits from its power. As a remedy, provision is being made for the installation over the next seven years of an additional 3.5 million kw installed potential, to perhaps double the per-capita consumption in the interior.

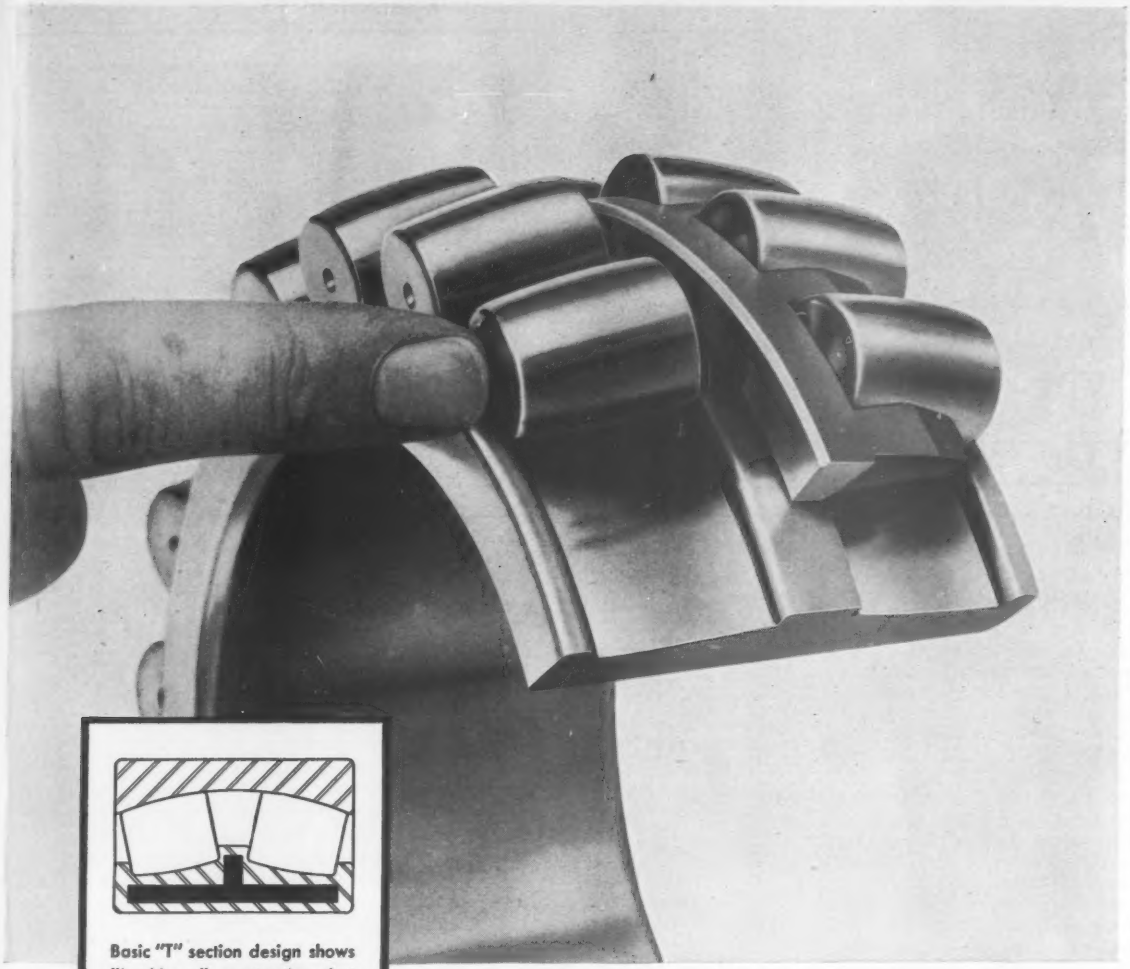
Seven Stories to Be Added To Building in Montreal

Bell Telephone Co. plans to increase the height of its Belmont St. building in Montreal from 7 to 14 stories. Work on the $3 million job will start next month; completion is scheduled for September.

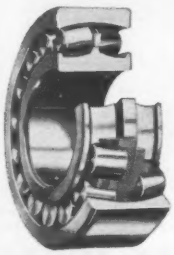
At present housing the Montreal area's long-distance telephone center, the building is destined to become the nerve center of a nation-wide direct-dialing system.

The stone walls of the steel-framed extension will be set back 20 ft from the walls of the existing building. The addition will increase floor area of the building by 110,000 sq ft.

Barott, Marshall, Merrett & Barott are the architects.



Basic "T" section design shows "backbone" construction that insures positive roller guidance and stability without skewing under all load conditions.



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The only *positive* way to guide rollers is by an integral center guide flange—backbone of the *Torrington* Spherical Roller Bearing. No locking ring can match it for stability under heavy radial and thrust loads.

This "bearing with the backbone" insures true rolling motion . . . prevents stress concentration . . . means minimum friction. It makes possible open-end cage design, too, with no shrouds to impede circulation of lubricant to bearing contact surfaces. There is less heating and more positive lubrication.

The integral center guide flange is adapted from the same principle used in the design of Torrington Tapered Roller Bearings. This refinement is typical of Torrington's uncompromising engineering that assures you the ultimate in bearing performance. **The Torrington Company, South Bend 21, Ind.—and Torrington, Conn.**

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Write for your free copy of descriptive Bulletin No. 701 to IRONITE COMPANY, Suite 729, 208 South LaSalle Street, Chicago 4, Illinois.

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In Havana: A New Hotel Is Dedicated

The new $14 million Havana-Riviera Hotel is now open for guests in the Cuban capital, just over a year after work was begun on the 19 story, 384 room structure.

Manpower rather than special techniques account mainly for the fast erection. For the first four months, contractor Irving Feldman, of Miami, worked 600 men on a 10-hour shift. Then, with the shell completed, he cut the force to 400.

For the sake of speed, the job was divided into three construction projects: the Y-shaped main building, the casino, and the swimming pool plus 80 cabanas.

Air conditioning in the guest rooms will be individually controlled. Refrigeration for the system will be absorption type, from which chilled water will circulate throughout the building.

The project is being financed by Canadian and U. S. hotel interests, headed by Harry and Ben Smith, Toronto hotel men. Architects were Polevitzky-Johnson & Associates, Miami, and Gaston & Carrera, Havana. Engineers were Saenz, Cancio & Martin, Havana.

In San Juan: New Annex Adds Hotel Space

Just opened in the Puerto Rican capital, a $1.2 million annex is the eight-year-old Caribe Hilton Hotel's response to a 170% increase since 1949 in the number of visitors to the island each year.

The seven-story, 100 room addition brings to 455 the hotel's total number rooms that are available for guests.

Called the Garden Wing, the new annex is connected to the main hotel by a covered walk.

Every room in the new structure is air-conditioned and has a terrace overlooking the sea.

Architects of the annex were Toro & Ferrer, of Puerto Rico, who designed the main hotel.

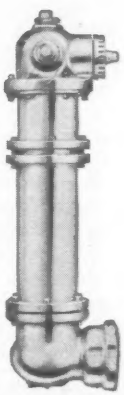
You'll see a demonstration of the completely revolving head. The entire head or nozzle section can be faced in any direction with none of the restrictions imposed by ordinary flanges. All that is necessary is to loosen the bolts in the flange.

We'll be glad to show you the R. D. Wood Swivel Joint Hydrant right in your office

We'll show you the optional breakable flange and stem coupling which permit quick repair and thus give the community better fire protection—and you won't have to get out of your office chair!

We mean a scale working model, of course, about 2 feet high and accurate down to the last nut and bolt. As we take it apart for you, you will see quite clearly the hydrant's sound, simple construction, the smoothly rounded changes in diameter which reduce friction and deliver water at full pressure.

It's a really reliable hydrant. Like to see it? Write us today for a demonstration.



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U. S. Army Redstone Missile

THE *FORWARD* LOOK

CHRYSLER CORPORATION

BRUNING Reproduction Machines help Chrysler Corporation in Vital Missile Work!

Most of the great work that Chrysler Corporation is doing in missiles must be classified for security reasons. It is no secret, however, that this progressive firm — creators of the advanced "forward look" in automobiles — has played a vital role in the development of the ballistic missile indicated above.

It is no secret, either, that Chrysler Corporation utilizes the outstanding advantages of modern Bruning Copyflex diazotype reproduction machines in this important work. Shown here is the imposing battery of Copyflex machines employed by the Chrysler Corporation. You can see for yourself the famous problem-free installation of Copyflex — no exhaust venting, plumbing, or auxiliary equipment. You can see, too, how Copyflex provides busy operators with such advantages as roomy feed tables, extra-large, convenient stacking trays.

And that's only part of the story. You, like Chrysler Corporation, should be benefiting by such modern Copyflex advantages as greater mechanical speeds, faster return of originals, synchronized exposure and development, automatic separation of originals from exposed prints, automatic stacking, and front-or-rear print delivery.

If you're not getting these important advantages, then every day you delay getting modern Copyflex is costing you time and money. Make the experience of Chrysler Corporation your basis for mailing the coupon below. You'll be glad you did!

Shown here is the impressive battery of Copyflex machines used by Chrysler Corporation for important reproduction operations in vital missile work. Machines need no venting, plumbing, or auxiliary equipment . . . provide Chrysler Corporation with important operating benefits.

Copyflex Gives You All These Advantages

Greater Convenience of Operation! Modern Copyflex gives printing widths up to 54″ to simplify feeding of large tracings, facilitate multiple feedings. Such features as extra-large delivery trays, automatic separation, and front-or-rear delivery further speed operator's work.

Faster Mechanical Speeds! New Copyflex models introduced within the past two years offer sharply increased speeds—up to 30% faster than before. Synchronized exposure and development assure top quality prints, one knob control simplifies operation.

Sharp, Uniform Prints! Developing solution is applied *directly* to exposed print assuring complete, positive development at all speeds and on all types of materials.

Problem-Free Installation and Operation! Clean, quiet, odorless . . . Copyflex requires no vents or plumbing, needs only an electrical connection for operation. Precision-engineered design, including use of selenium rectifiers instead of troublesome vacuum tubes, assures trouble-free operation.

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Sheffield Is Ready For The Highway Program

SHEFFIELD
ARMCO

Steel Products for Highways

Problems of right-of-way, financing and advance engineering in the National Highway Program are being whipped faster every day. And the dirt is flying. Interstate roads contracted for in the first half of this year were double the mileage of contracts let in the first half of '56.

Sheffield steel production is geared to the speed-up. We're making fast, on-schedule delivery of Sheffield Welded Wire Fabric, Reinforcing Bars, High-Strength Bolts and Highway Fence. And we are set to increase production to keep abreast of the growing need for these steel products and others.

Sheffield's strategic plant locations and expanded production facilities offer you time-saving advantages. Specifications written to high level standards of quality are readily met with Sheffield steel products.

SHEFFIELD DIVISION ARMCO STEEL CORPORATION SHEFFIELD PLANTS: HOUSTON • KANSAS CITY • TULSA

G. HAVAS, general manager, new Heavy Construction division of Kaiser Engineers.

L. H. OPPENHEIM, general manager, reorganized Kaiser Engineers Division.

J. E. HUGHES, assistant general manager, reorganized Kaiser Engineers.

JOHN HALLETT, assistant general manager, Heavy Construction Division.

Kaiser Engineers Reorganized

Henry J. Kaiser Co. is splitting its Kaiser Engineers Division into two closely tied but independent departments—a move company officials say is necessary "because of increased overseas business."

The new setup has a Heavy Construction Division handling heavy construction projects in the U.S., all overseas projects, and joint ventures.

A second division—retaining the name Kaiser Engineers—will direct all engineering and industrial construction activities in the U.S. and Canada.

George Havas, former general manager of Kaiser Engineers, heads the new Heavy Construction Division. Assisting Mr. Havas is John Hallett, who supervised the $135 million Tata Iron and Steel Co. expansion project at Jamshedpur, India.

The now-reorganized Kaiser Engineers Division is headed by L. H. Oppenheim, former assistant general manager of the division, before its reorganization. Second in command is J. E. Hughes. Before the Kaiser reorganization, Mr. Hughes directed major projects in Latin America.

All four top executives of the two new divisions are vice presidents of the Henry J. Kaiser Co.

Kaiser officials say the major changes in company organization result from mounting dollar volume ($430 million in projects completed last year), with an increasing proportion of the total coming from overseas contracts. Projects under way this year total $397 million.

Jobs scheduled for the Heavy Construction Division this year include design and construction of the huge Adaminaby Dam and Snowy Mountains hydro-electric project in Australia (a joint venture of Kaiser-Walsh-Perini-Raymond); and design of a pile casting yard for Creole Petroleum, in Venezuela.

Other responsibilities of the new division include direction of two subsidiaries – Kaiser Engineers Overseas Corp., and Kaiser Engineers International, Inc.

Projects planned for the Engineers Division this year include design and

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ELECTRIC PLANT NEWS

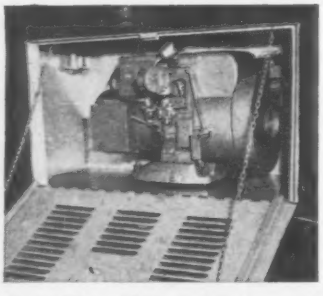
Truck-mounted electric plant cuts costs two ways

Onan Plant provides A.C. power for electric tools and lights, and D.C. output to charge batteries for radio communication.

Utilities using this dual-purpose Onan Electric Plant on trucks report savings ranging from *$2.00 per day* per truck to *$800.00 per year* per truck . . . for the battery-charging feature alone. Before installation of the Onan plant it was necessary to keep the large truck engine running to charge batteries, extremely wasteful from the viewpoint of fuel and engine maintenance.

The Onan plant shown is a Model O7AK, developing 750 watts of A.C. with about 8 amperes for 12-volt battery charging. It is powered by an Onan single-cylinder, air-cooled gasoline engine direct-connected to an Onan all-climate generator in a compact, rigid, long-life unit. A.C. output is sufficient for operation of drills, saws and other tools used for construction and maintenance.

Other vehicular battery charging plants and A.C. models available.



Vacu-Flo cooling system permits enclosed installation

With Onan's Vacu-Flo system, air is drawn (rather than blown) through generator and engine, and discharged through a duct to the outside. An Onan air-cooled plant with Vacu-Flo can be installed in a small compartment within truck or trailer.

Ask your Onan distributor about this dual-purpose unit or write for circular on three battery charging methods.

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construction of a steam power plant for St. Joseph Lead at Josephtown, Pa.; a plant for Arkansas Cement Co. at Foreman, Ark.; a diatomaceous earth plant for Eagle Picher at Lovelock, Nev.; a platformer for Shell Oil Co. at Trafford, Pa.; and preliminary design of a gas-cooled power reactor for the AEC at Idaho Falls, Idaho.

The Engineers Division also will direct activities of several Kaiser subsidiaries. These include Foothill Electric Corp., Henry J. Kaiser Co. (Canada) Ltd., and Henry J. Kaiser Construction Co.

Activities of the two main Kaiser divisions will be coordinated through an executive committee with Mr. Havas as chairman, and Mr. Oppenheim as vice-chairman.

Careers

Public Works

Edward Green, civil engineer for the Nickel Plate Railroad for the last 35 years, has been named head of the Fort Wayne, Ind., city engineering department.

C. A. (Bill) Shumaker has been named construction engineer for the Arkansas Highway Department, effective January 1. **J. T. Pendergrass,** now an engineer in the Materials and Test Division of the department will become assistant chief engineer.

Dean I. Dauley, city manager of Grand Prairie, Tex., will become Little Rock's first city manager on January 15.

William T. Eiffert, now assistant director, has become director of the Dayton, Ohio, water department succeeding **Loyd C. Huffman,** a city employee for 28 years, who is retiring. **Lloyd T. Hagerty,** sewage treatment engineer, will become assistant water director.

John F. Lucey, former Schenectady city engineer, has been appointed assistant superintendent for engineering and research of the New York State Department of Public Works.

Harry F. Lewis has been appointed engineering consultant to the U. S. Navy Administration Unit, Saipan, Marianna Islands.

Kenneth A. Dunbar is now manager of the Atomic Energy Commission's Portsmouth, Ohio, area office.

Business

Thomas M. Berry has been appointed general superintendent of the shaft and tunnel department of Dravo Corp., Pittsburgh. His principal responsibility will be to supervise construction of the 10 miles of sewage tunnel Dravo is building for the Allegheny County Sanitary Authority.

- **LOW MAINTENANCE**
- **FIRE PROTECTION**
- **FLEXIBILITY IN DESIGN**
- **LOW FLOOR-TO-FLOOR HEIGHTS**
- **SPEED OF CONSTRUCTION**
- **ARCHITECTURAL BEAUTY WITHOUT NEED FOR AUXILIARY ORNAMENTATION**

. . . were major factors in the choice of

REINFORCED CONCRETE

for Buffalo's four new parking ramps

Today, more and more parking garages are being built, and more and more are being constructed of reinforced concrete. Four outstanding examples of this trend are the new reinforced concrete parking ramps in Buffalo, New York. Among the reasons the architects and consulting engineers specified reinforced concrete are lower insurance rates . . . especially in the exposed structural systems where the inherent fireproof qualities of reinforced concrete are particularly required. Another, reinforced concrete requires practically no maintenance, needs no painting or other protection. Also, with reinforced concrete, construction proceeds to completion faster because all necessary materials and labor are readily available from local sources.

Consulting Structural Engineer on all four jobs pictured below — **James N. De Serio, P.E.**

BROADWAY MARKET & PARKING RAMP
Architects: James, Meadows & Howard
General Contractor: Siegfried Construction Co.

SENECA PARKING RAMP
Architects: James, Meadows & Howard, and Abbott, Merkt & Company
General Contractor: Siegfried Construction Co.

MOHAWK PARKING RAMP
Architects: James, Meadows & Howard, and Abbott, Merkt & Company
General Contractor: John W. Cowper Co., Inc.

EAGLE PARKING RAMP
Architects: James, Meadows & Howard, and Abbott, Merkt & Company
General Contractor: John W. Cowper Co., Inc.

SLAB BAND FLOOR CONSTRUCTION, at Mohawk Ramp and Seneca Ramp, was necessitated by particular column arrangement.

CONCRETE REINFORCING STEEL INSTITUTE
38 South Dearborn Street • Chicago 3, Illinois

This is the first of two spillway tunnels being built as part of the $421,000,000 Glen Canyon Dam project at Kanab, Utah. Le Roi H10AL air legs are doing 95% of the drilling on this job.

Water, mud, and grit present a constant problem. Yet, the H10AL air legs are keeping the project on schedule, the superintendent reports.

20 Le Roi H10AL Air Legs cut through 1750 ft. of solid sandstone without a major breakdown

Le Roi Air Legs Conquer Tough Tunnel Job

"Average downtime per machine is only 3 hours per month under the roughest conditions I've ever seen," says tunnel superintendent.

Not one major breakdown — not a single replacement needed since the start of operations in October, 1956. That's the endurance record of the Le Roi H10AL air legs being used to drill water diversion tunnels through solid sandstone.

They've been at it six days a week, averaging 15 ft. a day, under extremely severe operating conditions — and show no signs of letting up, according to the tunnel superintendent. It's rough on men and machines.

Two Giant Tunnels

The job involves the drilling of shot- and roof-bolt holes in two tunnels 2740 and 2900 ft. long for the Glen Canyon Dam on the Colorado River. Each will be 43½ ft. wide at the upper end and 46½ ft. wide at the lower.

Drillers work on a specially-built five-deck jumbo rig, mounted on wheels. Air legs, using 1 in. drill steel, are used on all five levels. Holes are drilled about 18 ft. into the face, at speeds of four minutes per hole.

Tough Going

Actual drilling cycles average four hours per day. But it's tough going every foot of the way. Mud and bad water seepage — 30,000 gallons pumped out daily — make drilling even tougher.

Grit, grime, and water cover everything. The abrasive sand found in the tunnel is equal to 60-grit stone — and gets into everything. Yet, the average replacements on the machines have been springs, seals, bushings, and leather gaskets. Mechanical parts are still intact.

The simple design of the Le Roi air legs has been a real time- and money-saver. "We can tear down and re-assemble a unit in minutes," the superintendent explains. "Average monthly downtime has been 3 hours per machine. Cost of maintenance per machine totals only $20 per month." Like the internal parts, the automatic heads that control the flow of water for drill steel have not required maintenance to date.

"The Le Roi air legs are doing a good job for us in the tunnel," the superintendent added. "They have performed continuously with a minimum of downtime, helping us to keep up with our schedule."

Types Available

Le Roi H10AL air legs are available in single or telescopic types, with 3, 4, 5, or 6 ft. feeds. Your operators will find them easy to handle in roof-bolting, stoping, drifting, or sinking operations. See them at your Le Roi distributor, or write the Le Roi Division, Westinghouse Air Brake Co., Milwaukee 1, Wisconsin.

AT-722

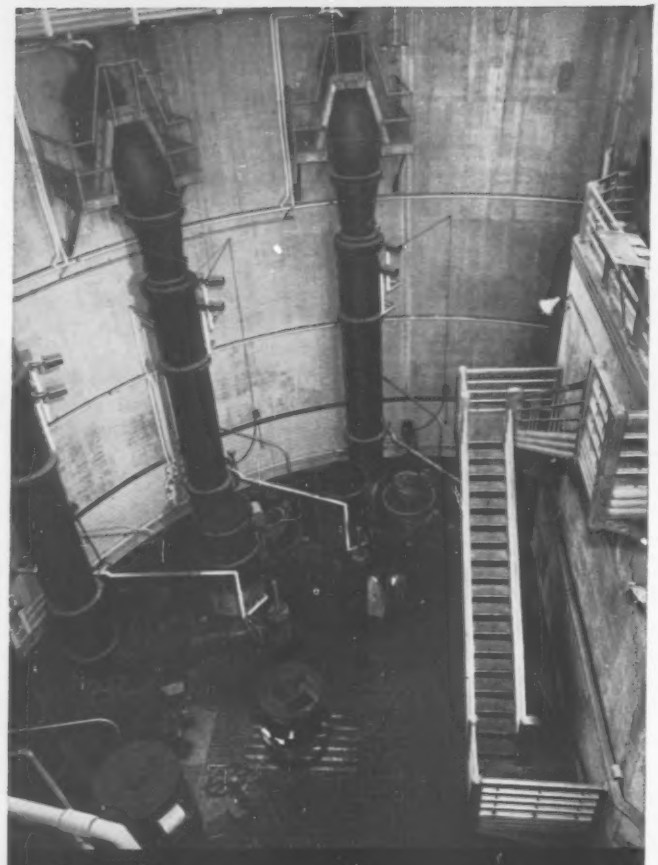
WABCO

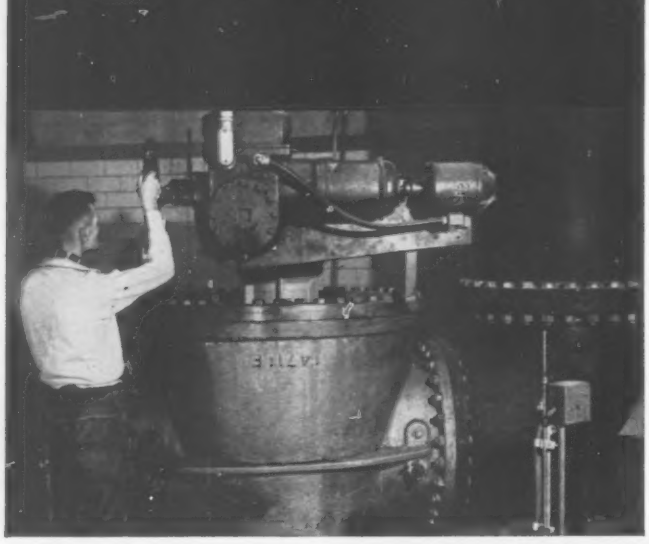
LE ROI Division of Westinghouse Air Brake Co., Milwaukee 1, Wisconsin, manufacturers of Newmatic air tools, Tractair®, portable and stationary air compressors, and heavy-duty industrial engines. Write us for information on any of these products.

Special jumbo rig holds 35 men and 16 air legs. When holes are drilled and charges set, wheeled rig is pulled away.

Le Roi air legs are versatile. View shows them being used for drilling and roof-bolting. Bolt holes are sunk on 4 ft. centers. Men are on top level of rig.

Three-man crews operate two air legs. The Le Roi H10AL air legs are easy to handle, making them ideal for operation in close quarters.





SMS-Rotovalves On Sewage Pump Discharge

GIVE ACCURATE THROTTLING

At Philadelphia's Southeast and Central Schuylkill Pumping Stations, twelve SMS-Rotovalves with electric operators are installed at the discharge ends of vertical centrifugal pumps. These 30-inch Rotovalves were chosen for their reliability of operation and ability to throttle pump discharge accurately.

Their full-line opening cuts pressure loss to lower pumping costs. Self-purging, monel-to-monel seats are out of the stream, and less subject to wear. Rotovalves give quick, easy throttling operation. Bronze trunnions eliminate friction as the plug first lifts, then turns, finally reseats in the desired position. For emergency closure, maximum initial shut-off eliminates sufficient line surge shock to prevent damage to pump parts.

You can obtain full information on SMS-Rotovalves, as well as the complete line of Ball Valves and R-S Butterfly Valves, by contacting our nearest representative. Or, write to S. Morgan Smith Company, York, Penna.

◀*Overall view shows dry well and discharge risers. Close-up (lower photo) shows a 30-inch Rotovalve equipped with electric motor-driven operators.*

SMS

S. MORGAN SMITH HYDRODYNAMICS

AFFILIATE: S. MORGAN SMITH, CANADA, LIMITED, TORONTO

6

Rotovalves • Ball Valves • R-S Butterfly Valves • Free-Discharge Valves • Liquid Heaters • Pumps • Hydraulic Turbines & Accessories

Biscayne Bay Bridges

Bid prices on two precast bridges near Miami, Fla.

Powell Bros., Inc. and Heavy Constructors, Inc., Ft. Lauderdale, Fla. have the first contract on the Miami Expressway System, to be financed from Interstate funds, $3,543,995, for construction of two bridges over Biscayne Bay at Miami.

Both bridges will have a fixed clearance of 55 ft over mean water, the first fixed structures over the Atlantic Intracoastal Waterway.

Opposition to this fixed clearance from navigators of large sailing craft, held things up for six months of consideration and a public hearing, before the Corps of Engineers dismissed these objections and granted permission to proceed with the construction of the bridges.

The first bridge has a channel span of 130 ft of simple steel deck plate girder construction, flanked on either side by five 98 ft spans and eight 65 ft spans using precast-prestressed concrete.

The second uses the precast-prestressed concrete spans throughout, one channel span of 98 ft flanked on either side by eight 65 ft spans.

The concrete beams will be AASHO-PCI, Type IV.

The complete crossing will include dredged fills between the bridges, and connecting bridges to the shore lines on either side of the bay.

The engineers for the Florida State Highway Dept. estimate the cost of the complete superstructure of the 98 ft prestressed spans (which includes all structural items above the piers) at an approximate average of $7.78 per sq ft, and for the 65 ft spans, approximately $5.84 per sq ft. They consider this very favorable. They also regard the unit price of $31 a lin ft for the large Type IV beams as favorable, when compared with an approximate cost of 20¢ a lb for equivalent steel I-beams with welded flange plates. The precast-prestressed beams are designed to carry at least 30% more load than steel beams at 155 lb per lin ft.

The width of the bridges provides for six lanes of traffic on two 38 ft clear roadways, separated by a 4 ft mountable median. Two 2 ft emergency walks on each side make up the remainder of the total width—84 ft clear between faces of the handrails.

Approximate wages in the Miami area range from $1.25 for common labor to $3.25 for skilled.

The eight bids went as follows:

1C Powell Bros., Inc. and Heavy Constructors, Inc., Ft. Lauderdale, Fla.	$3,543,995
2 Cleary Bros. Construc Co., West Palm Beach, Fla.	3,591,140
8 Hardaway Contracting Co., Columbus, Ga.	4,428,287

Bids: 9-19-57 Items	Unit	Quantity	Unit Prices 1C	2
Timber, structural, 12 lb treatment	Mfbm	45.65	$465.00	$400.00
Conc, Cl A, bulkhead	cy	120	90.00	75.00
bent caps	cy	224	60.00	75.00
piers	cy	10,796	50.00	55.00
superstructure	cy	7,639	58.00	60.00
seal	cy	1,017	60.00	55.00
handrail	lf	6,540	4.20	6.00
Steel, reinforcing	lb	3,160,700	0.135	0.12
struc, plate girder span	lb	488,900	0.21	0.23
shoe assemblies	lb	246,000	0.46	0.50
ladders & platforms	lb	8,100	0.50	0.65
Piling, treated timber	lf	14,580	3.70	3.00
precast conc, 20" sq furnished	lf	35,200	6.75	6.50
driven	ea	1,196	100.00	110.00
composite conc & stl 20" sq furnished	lf	17,700	7.75	7.50
stl (14 BP 73) furn	lf	12,000	7.90	6.25
driven	ea	208	61.00	110.00
unloaded test ,20" sq	lf	600	30.00	25.00
Test loads, 110 tons	ea	2	100.00	100.00
Piling, conc sheet, 16"x30"	lf	4,000	8.00	7.50
Shear connectors	lb	2,150	0.50	0.40
Navigation lights	ls	job	5,500	5,500
Roadway lighting	ls	job	46,000	47,500
Beams, prestressed, type D	lf	28,784	19.00	19.00
IV	lf	14,977	31.00	32.50
Punching for piles	ea	380	30.00	30.00

Completion schedule: 400 working days

Parking Lot, St. Louis Municipal Airport, Mo.

Ten contractors competed for this job of constructing some six acres of additional parking facilities for 750 to 800 cars at the Lambert-St. Louis Municipal Airport, Mo. Israel Bros. Asphalt, Inc., Clayton, Mo. got the contract at $132,930, an average of $22,155 per acre and $166.16 to $177.24 per car stall.

This is 33% below the estimate of the engineers, Sverdrup & Parcel, Inc.

The contractor furnishes all materials. Transportation to the jobsite will be by truck.

Wages on this job will include: Tractor operators, $3.45; truck drivers, $2.60; common labor, $2.40.

The bidding went this way:

1C Israel Bros. Asphalt, Inc., Clayton, Mo.	$132,930
2 V. & M. Contracting Co., Inc., St. Louis	134,464
10 Fred Weber Contractors, Inc., St. Louis, Mo.	190,037
EE Sverdrup & Parcel Engineering Co., St. Louis	198,000

Bids: 11-12-57 Items	Unit	Quantity	Unit Prices 1C	2
Remove abandoned house	ea	1	$25.00	.....
Clear and grub	ls	job	500.00	2,500
Excavation, uncl	cy	71,200	0.55	0.63
Subbase crse, cr agg	cy	4,000	5.50	4.88
Crse, gradation B	cy	3,200	5.50	4.88
Bit prime coat, agg	gal	14,300	0.20	0.17
Conc comb surf crse	t	2,850	7.30	7.30
Curb and gutter	lf	458	3.00	2.90
Fence, ch link Cl E	lf	2,140	2.22	2.21
CP, std str, reinf 12"	lf	90	3.28	3.50
15"	lf	302	4.00	4.40
18"	lf	40	5.22	5.00
21"	lf	123	6.95	6.50
CMP, perf, underdrain, 6"	lf	121	3.20	2.50
Catch basins	ea	11	180.00	175.00
Bit conc curb	lf	2,955	0.50	0.60
Conc sidewalk	sf	2,760	0.65	0.50
Stripe, mark, fertilize and seed	lf	20,500	0.06	0.06
Mulch	ac	7	400.00	540.00
Lighting, instal	ls	job	11,620	9,648

Completion: 180 cal/days

Issued to Mark The Silver Anniversary of

Singleton's MANUAL of STRUCTURAL DESIGN

In conformity with ACI specifications, entirely new data is provided on concrete joist, concrete slabs, flat slabs, stirrups, concrete columns, footings and retaining walls. Many additional pages have also been provided on structural steel.

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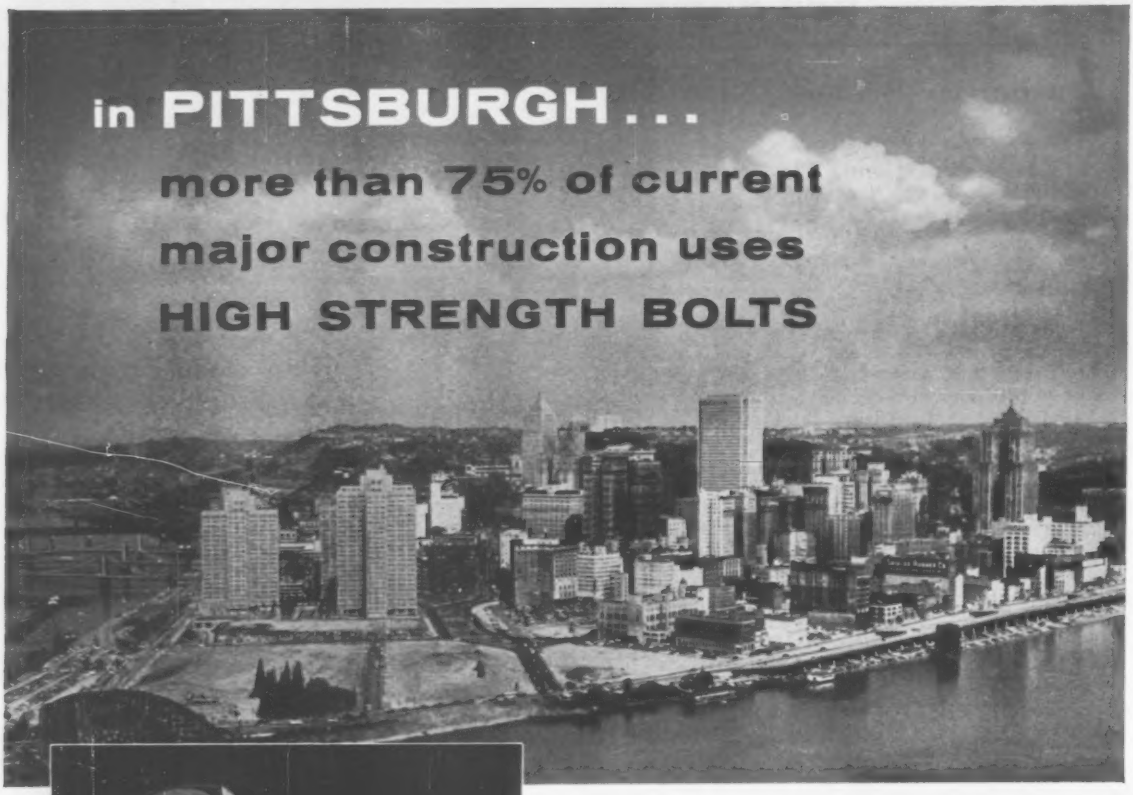

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Materials and Labor Prices

Monthly Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES:

- Clay Products, Lime, Plaster, Paint, Roofing: Last, Dec. 26: Next Jan. 30.
- Wage Rates, Building Board, Lath, Insulation: Last, Jan. 2: Next Jan. 30.
- Cement Aggregates, Ready-mixed Concrete Asphalt: Last, Jan. 9: Next Feb. 6.
- Iron & Steel Products, Pine: Last, Jan. 16: Next Feb. 13.

LUMBER, TIMBER, PLYWOOD—PER M FT., B.M., CARLOAD LOTS F. O. B.

SOUTHERN PINE AND DOUGLAS FIR

All Southern Pine is No. 2 common or better and for No. 1 N. C. Box. (Prices in Bold Face)

All Fir boards, dimensions, planks No. 2, Fir small timbers and timbers are No. 1. Lengths up to 20 ft. (Prices in italics)

	1x6 s4s	1x8 s4s	2x4 s4s	2x6 s4s	2x8 s4s	2x10 s4s	3x12 Rgh	6x12 Rgh	12x12 Rgh	LONG LEAF Y. P. Merchantable grade up to 20 ft. 2x12 Rgh	LONG LEAF Y. P. Merchantable grade up to 20 ft. 12x12 Rgh	PLYWOOD Rail freight increment (See note for base price) ⅜"	PLYWOOD Rail freight increment (See note for base price) ½"
Atlanta†‡	**$73.00**	**$78.00**	**$76.00**	**$79.00**	**$81.00**	**$86.00**	**$136.00**	.....	.....	**$121.00**	**$156.00**	**$22.32**	**$27.24**
Baltimore†	**95.00**	**100.00**	**100.00**	**100.00**	**100.00**	**105.00**	**114.00**	.....	.....	**170.00**	**185.00**	**25.92**	**31.00**
	100.00g	*105.00g*	*125.00g*	*125.00g*	*125.00g*	*125.00g*	*155.00g*	*$180.00*	*$144.00*	.....	.....	.....	.....
Birmingham†‡	**80.00**	**82.00**	**75.00**	**82.00**	**85.00**	**90.00**	**105.00**	.....	.....	**115.00**	**160.00**	**21.78**	**26.58**
	70.50	*70.50*	*67.00*	*70.00*	*70.00*	*85.00*	*73.50*	*70.50*	*70.50*	.....	.....	.....	.....
Boston‡	**90.00f**	**90.00f**	**96.00f**	**96.00f**	**96.00f**	**104.00a**	.....	.....	.....	.....	.....	**25.92**	**31.00**
	90.00k	*90.00k*	*104.00*	*104.00*	*106.00*	*109.00*	*118.00*	*118.00*	*123.00*	.....	.....	.....	.....
Chicago†‡	**93.00**	**98.00**	**90.00**	**104.00**	**112.00**	**113.00**	**108.00**	.....	.....	**136.00**	**126.00**	**22.45**	**27.37**
	100.00	*100.00*	*113.00*	*111.00*	*111.00*	*112.00*	*120.00*	*120.00*	*120.00*	.....	.....	.....	.....
Cincinnati†	**93.00**	**94.25**	**86.50**	**90.50**	**95.00**	**102.75**	**116.00**	.....	.....	**129.50**	**127.50**	**25.00**	**30.48**
	90.25	*91.25*	*95.50*	*97.50*	*98.25*	*109.00*	*131.00*	*131.00*	*131.00*	.....	.....	.....	.....
Cleveland†	**90.00**	**93.00**	**90.00**	**96.00**	**96.00**	**100.00**	.....	.....	.....	.....	.....	**25.37**	**30.93**
	.....	.....	*99.00*	*96.50*	*96.50*	*98.50*	*136.00*	*136.00*	*136.00*	.....	.....	.....	.....
Dallas‡‡	**70.00**	**70.00**	**65.00**	**65.00**	**65.00**	**70.00**	**140.00**	.....	.....	**126.00**	**130.00**	**18.72**	**22.80**
Denver*	*Not in stock*		*122.50*	*122.50*	*122.50*	*127.00*	*156.00*	*148.50*	*153.50*	.....	.....	**13.92**	**16.98**
Detroit‡	**116.50**	**119.00**	**115.00**	**117.00**	**122.00**	**122.00**	.....	.....	.....	**130.00**	.....	**25.00**	**30.48**
	125.00	*125.00*	*127.75*	*122.50*	*120.00*	*135.00*	*135.00*	*135.00*	*135.00*	.....	.....	.....	.....
Kansas City‡	**120.00**	**120.00**	**120.00**	**120.00**	**125.00**	**135.00**	.....	.....	.....	.....	.....	**16.58**	**20.16**
	120.00	*120.00*	*120.00*	*120.00*	*125.00*	*125.00*	*150.00*	*225.00*	*225.00*	.....	.....	.....	.....
Los Angeles‡	*92.00*	*92.00*	*92.00*	*92.00*	*92.00*	*95.00*	*119.00*	*150.00*	*150.00*	.....	.....	**16.61ab**	**$0.25ab**
Minneapolis§	*135.00m*	*135.00m*	*140.00*	*140.00*	*140.00*	*140.00*	*185.00*	*185.00*	*185.00*	.....	.....	**19.80**	**24.25**
Montreal‡ab	**90.00**	**90.00**	**90.00**	**91.00**	**103.00**	**125.00**	.....	.....	.....	**122.00**	**122.00**	.....	.....
	125.00	*125.00*	*125.00*	*125.00*	*125.00*	*125.00*	*170.00*	*170.00*	*170.00*	.....	.....	.....	.....
New Orleans†	**87.00**	**87.00**	**94.50**	**91.00**	**90.00**	**97.00**	**121.50**	.....	.....	**151.00**	**151.00**	**18.72**	**22.80**
†	*105.00*	*105.00*	*99.50*	*115.00*	*115.00*	*115.00*	*137.50*	*137.50*	*147.50*	.....	.....	.....	.....
New York‡	**105.00**	**107.00**	**112.00**	**114.00**	**114.00**	**120.00**	.....	.....	.....	**240.00**	**250.00**	**25.92**	**31.00**
	.....	.....	*116.00*	*118.00*	*118.00*	*119.00*	*162.00*	*162.00*	*162.00*	.....	.....	.....	.....
Philadelphia‡		Range from 109/120				**117/137**	**117/137**	.....	.....	**214/224**	**214/224**	**28.00**	**32.00**
		Range from 130/150				*131/163*	*133/155*	*165.00*	*165.00*	.....	.....	.....	.....
Pittsburgh2	**120.00**	**120.00**	**125.00**	**120.00**	**125.00**	**130.00**	**145.00**	.....	.....	**149.00**	**185.00**	**25.92**	**31.00**
	130.00	*130.00*	*140.00*	*140.00*	*140.00*	*140.00*	*185.00*	*185.00*	*185.00*	.....	.....	.....	.....
St. Louis§	**113.00**	**117.00**	**125.00d**	**125.00d**	**125.00e**	**130.00c**	.....	.....	.....	.....	.....	**18.72**	**22.80**
	.....	.....	*137.00*	*133.00e*	*133.00e*	*137.00e*	*191.00e*	*191.00*	*191.00*	.....	.....	.....	.....
San Francisco‡	*74.00*	*74.00*	*80.00*	*80.00*	*80.00*	*80.00*	*102.00*	*115.00*	*115.00*	.....	.....	**12.22**	**14.91a**
Seattle†	*67.00*	*65.00*	*65.00*	*65.00*	*65.00*	*65.00*	*72.00*	*85.00*	*85.00*	.....	.....	.....	.....
Toronto‡a	**91.50**	**95.50**	**92.50**	**91.50**	**91.50**	**91.50**	.....	.....	.....	**93.50**	.....	.....	.....
	115.00	*115.00*	*121.00*	*123.00*	*127.00*	*131.00*	*146.00*	*141.00*	*151.00*	.....	.....	.....	.....

† F.o.b. mill. * F.o.b. city, CL, out of yard. ** F.o.b. city, CL, direct mill shipment. ‡ Deliv. to contr. CL. 1. Retail, LCL, at yard. § Retail, LCL, deliv. 2. Deliv. truck lots. 3. ssd., truckload lots, 8/6 Mfitbm

LUMBER: Bold Face Type, Southern Pine. Italics, Douglas Fir. [a] Spruce. [b] Tax exempt. [c] 8M lots. [d] 8, 10, & 12 ft. lengths. [e] 8 to 18 ft. lengths. [f] Hemlock [g] No. 1 common. [j] 8 ft. lengths. [k] No. 3 common. [l] Incl rail rate from North west mills to San Francisco are $11.50 to $15.00 per M ft. bm. From Northern Calif. mills $9.00 by rail, $9.50 by truck. All rates for surfaced stock. For rough, add $3.00 to above figures. [m] Up to 16"

PLYWOOD (Plyform, oiled and edge sealed): Douglas fir, 4' x 8' panels, 5-ply sanded 2 sides, carload lots delivered per 1000 sq. ft. surface. Seattle base price, Interior, moisture resistant, ⅜", $146.00; ½", $166.00. Exterior, waterproof, ⅜" $150.00; ½", $170.00. For other centers add rail freight increment from table on proper size. [a] Lower rate by water shipment. [b] 50,000 lbs. minimum.

GLASS, EXPLOSIVES, CHEMICALS

	WINDOW GLASS Discounts from jobbers list, Feb. 1, 1950a Single or Double Strength A quality	WINDOW GLASS Discounts from jobbers list, Feb. 1, 1950a Single or Double Strength B quality	EXPLOSIVES Per lb. 40% Ammonia Gelatin in 50 lb. cases delivered in 200 lb. lots*
Atlanta	78%c	78%c	$0.2615
Baltimore	74%d	76%d	.2615
Birmingham	82%	82%	.2665
Boston	72-10%	72-10%	.2615
Chicago	72%	73%	.2615
Cincinnati	74%	74%	.2615
Cleveland	74-3-10%	74-2-10%	.3015
Dallas	76%	76%	.2890
Denver	74%	74%	.2865
Detroit	74-10-10%	74-10-10%	.2815
Kansas City	74-10-10%	74-10-10%	.2665
Los Angeles	70%	76%e	.2640
Minneapolis	71-10%	71-10%	.2665
Montreal	40-10-5%bc	40-10-5%b	$3.05h
New Orleans	78%	76%	.2665
New York	79-10%	79-10%	.45g
Philadelphia	74-10%	76-10%	.2615
Pittsburgh	72%	72%	.2615
St. Louis	73-10-10%	72-10-10%	.2665
San Francisco	60%-25%	68%-25%	.2615
Seattle	67%	72%	.2640

Price of 60% Ammonia Gelatin is $0.15 per lb. higher than 40% in U. S., $1.75 per 100 lbs. higher in Ca nada.

Glass: [a] Jobbers' list price per box, 14 x 20, ea, $42.75 for A quality, $37.50 for B quality; 14 x 20, ds, $60.00 for A quality. $52.75 for B quality. [b] sales tax extra. [c] 77% for single strength [d] Discount 6/15/52. [e] 77% for double strength

Explosives: * Cartridges of 1¼", 1½", 1¾", 2", 2¼", 2½", 3" diameters. Urban prices influenced by service charges or local storage and delivery regulations do not consistently reflect quantity prices in less congested areas. [g] In borough of Kings, Queens, and Richmond and in Manhattan south of Canal St., add delivery charge of $20.00 per trip. [h] F.o.b Beloeil (near Montreal), per 100 lb. forcite, 40%. Forcite 60%, $23.80

40% Ammonia Gelatin price ranges in other than urban areas, per lb. (except Seismograph Grades)

	C/L 20,000 lb. net	Tons	200 lb. lots
E of the Miss., except Fla and Me	$0.2065	$0.2465	$0.2615
W of Miss. to Rocky Mtn. States, Fla. and Maine	.2115	.2515	.2665
Rocky Mtn. States	.2115	.2515	.2665
Pacific N. W. States	.2090	.2490	.2640
Pacific S. W. States	.2065	.2465	.2615

PILES, TIES F. O. B.

PILES

Prices per linear foot, fir and pine, bark off, f.o.b. cars, New York. Fir based on Wash. and Ore. points to New York shipping area; pine based on freight from Norfolk.

Dimensions	Points	Length	By Rail Pine*	By Rail Fir
12-in. at butt	6-in.	30 to 50-ft.	$0.51	....
12-in.—2-ft. from butt	6-in.	50 to 59-ft.	.54	....
12-in.—2-ft. from butt	6-in.	60 to 69-ft.	.58	....
12-in.—2-ft. from butt	6-in.	90 to 100-ft.	....	....
13-in.—3-ft. from butt	6-in.	91 to 100-ft.	....	....
14-in.—2-ft. from butt	6-in.	50 to 69-ft.	.80/.88	....
14-in.—2-ft. from butt	6-in.	70 to 79-ft.	.78/.88	.93
14-in.—2-ft. from butt	5-in.	80 to 85-ft.	.83/.93	.94
14-in.—2-ft. from butt	5-in.	85 to 89-ft.	....	1.00
14-in.—2-ft. from butt	5-in.	90 to 100-ft.	...	1.03

* Pine piling over 80-ft. available only in limited quantities

RAILWAY TIES

Prices f.o.b. per tie for carload lots:

		6" x 8" x 8' Untr.	6" x 8" x 8' Tr.	7" x 8" x 8'6" Untr.	7" x 8" x 8'6" Tr.
Birmingham*	Hardwood, Grade 3	$1.70	$2.55	Gr. 5 $2.25	$3.33
	Grade 2	1.50	2.35	" 4 2.10	3.18
	Grade 1	1.15	2.00	" 3a 1.70	2.78
Chicago	Red Oak	....	4.00a	....	4.60a
New York	S. L. Sap Pine	2.00	4.00	3.00	6.00g
	Mixed Oak	2.50	4.50	3.50	6.50g
Philadelphia	Red Oak	2.95/3.15	4.50/4.70	3.60/3.80	5.50/5.75
St. Louis	Mixed Oak	2.65	3.40a	2.90h	3.75ah
San Francisco	Douglas Fir	2.03ef	2.96ef	2.84bef	4.31ca

Tr.—Treated; Untr.—Untreated. *a* Creosoted. *c* Empty cell. *e* Green *f* f.o.b. cars. *g* 7 x 9 x 8' 6" * Add 75¢/tie freight charge to Birmingham. [h] 7" x 9" x 9½"

CHEMICALS

Water, sewage treatment, road work, f.o.b. carlots, New York

Bleaching powder in drums f.o.b. works, per 100 lb.	$5.02
Chlorine cylinders, liquid, per lb. f.o.b. works	.103
Calcium chloride, 77–80%, flaked, 100-lb. paper bag, f.o.b. works, ton	29.00
Silicate of soda, 52 deg., in drums, f.o.b. works, per 100 lb.	2.30
Soda ash, 58%, in paper bags, per 100 lb. dense	1.70
Sulphate of aluminum, commercial, in 100-lb. bags f.o.b. works	1.85
Sulphate of copper, in bags, 99% per 100 lb. f.o.b. works	14.90

Construction Reports

Bids Asked—Low Bidders—Contracts Awarded—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. WETZEL, M. E. SCIORRA, D. TARTAGLIA, Reports
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

BUILDINGS—BA

▲ **Mass., North Dartmouth**—SCHOOL—BA 2/5—Roman Catholic Archdiocese Fall River, Most Rev. James L. Connolly, Bishop, 362 Highland Ave., Fall River, Catholic Memorial High School. $2,000,000. Plans deposit $100. Chester F. Wright, 681 Main St., Waltham, Mass., archt. CD 7/23.

HEAVY CONSTRUCTION—LB & CA

▲ **Topstone Holding Corp.**, Mountain Rd., Redding, Conn., Owner Builds. $1,175,000. site development, roadways, storm sewers in Corp. Owned Development, RIDGEFIELD, CONN.

BUILDINGS—LB & CA

▲ **Alvin Constr. Co.**, 333 Washington St., Boston, Mass., CA Approx. $1,000,000, RESIDENTIAL DEVELOPMENT, 28 houses, FRAMINGHAM, MASS. Ellendale Trust Co., 333 Washington St., Boston, Mass. Lester N. Lichter, 739 Boylston St., Boston, Mass., archt.

▲ **Central Engineering & Constr. Co.**, 155 Main St., Pawtucket, R. I., LB $1,524,990 (14 bidders) Proj. BI-R-147, Howard H. Ellis Regional Technical SCHOOL, DAYVILLE, CONN. State P. Wks. Dpt., 165 Capitol Ave., Hartford, Conn. Bids Jan. 8. CD 11/27.

MIDDLE ATLANTIC

BUILDINGS—BA

† **New Jersey**—HOUSING—BA 1/30—U. S. Eng., 111 E. 16 St., New York 3, N. Y., construct 52 units of Capehart permanent family housing at Plainfield and Morristown. $750,000-$850,000. Plans deposit $25. Extended date. CD 12/13.

▲† **N. J., Fort Dix**—HOUSING—BA About 2/6—U. S. Eng., P.O. Box 8629, Phila., Pa., 702 family housing units in 351 bldgs., IFB ENG-36-109-58-5. $8,500,000. CD 9/20, under LB.

▲ **N. J., West Milford**—SCHOOL—BA 2/28—Bd. Educ., West Milford, school, Macopin Marshall Hill Rd., addns. to Paradise Knolls and Hillcrest Schools. $2,100,000. Neil Greydanus, 157 Cedar Ave., Hawthorne, archt. CD 8/7/56.

HEAVY CONSTRUCTION—LB & CA

MacNutt Electric Co., Inc. & Goodrich Electrical Installation Co., Inc., 420 Lexington Ave., New York, N. Y. CA $988,605. Contr. P-105, power equipment for Broadway-Seventh Ave. Line and Lenox Ave. Line, IRT Div., NEW YORK, N. Y. New York City Transit Auth., 370 Jay St., Brooklyn 1, N. Y. Bids Dec. 13. CD 12/26, under LB.

▲ **Roscoe Engineering Corp. & Ajax Constr. Co., Inc. & Assocs.**, 1107 19 St., Wash., D. C. CA $5,596,000. operational site, New York defense area, clearing, excav., 56 launcher stands, moveable roofs, 2 compressor bldgs., storage bldg., paving and utilities, McGuire Air Force Base, WRIGHTSTOWN, N. J. Purchasing Officer, McGuire Air Force Base, Wrightstown, N. J. Wigton-Abbott Corp., 1225 South Ave., Plainfield, N. J., engrs.

BUILDINGS—LB & CA

▲ **Lefrak Organization**, 97-27 64th Rd., Forest Hills, N. Y., Owner Builds. $2,300,000. three 8 story APARTMENTS in area bounded by Ave. Y, Ave. Z, Haring St., and Batchelder Ave. to be called Kings Bay Housing, BROOKLYN, N. Y. S. J. Kessler & Sons, 531 Fifth Ave., New York 17, N. Y., archts. CD 2/1.

▲ **Two Guys From Harrison, Inc.**, 209 Port St., Port Newark, N. J., Separate Contracts. $1,000,000. 1 story, 167,000 sq. ft., brick, block, aluminum front RETAIL STORE, BORDENTOWN, N. J. S. Lawrence Klein, 17 Academy St., Newark, N. J., archt.

▲ **Wilf & Wilf**, 220 Parker Rd., Elizabeth, N. J. CA Est. $1,750,000. 75 HOUSES, Stiles Ave., LINDEN, N. J. Mr. Harry Wilf, 380 Irvington Ave., Elizabeth, N. J., and Mr. Jos. Wilf, 220 Parker Rd., Elizabeth, N. J. Herbert Southern, 1453 Irving St., Rahway, N. J., archt.

▲ **Malan Constr. Corp.**, 2 Park Ave., New York, N. Y. CA Est. $2,000,000. LABORATORIES and ADMINISTRATION BLDGS., James Forrestal Research Center, PRINCETON, N. J. U. S. Atomic Energy Comn., (Princeton, New Jersey University, owner's agent), 70 Columbus Ave., New York, N. Y. Bids Dec. 8. CD 11/8.

▲ **L-D Building Co.**, Box 472, Latrobe, Pa. LB $1,167,800. (8 bidders), general construction SECONDARY SCHOOL for Punxsutawney Area Joint School Bd., PUNXSUTAWNEY, PA. Pub. School Bldg. Auth., 101 S. 25 St., Harrisburg, Pa. Bids Jan. 9. CD 12/11.

Morrow Bros., 2315 N. Charles St., Baltimore 18, Md. CA $856,200. brick, concrete, steel, block, asph. tile Johnnycake Elementary SCHOOL, North Catonsville, TOWSON, MD. Baltimore Co. Bd. Educ., Aigburth Rd., Towson 4, Md. Bids Dec. 19. CD 12/27, under LB.

Eisen-Magers Constr. Co., 145 Kennedy St. N.W., Wash., D. C. CA $874,650. (with alt.), constr. Florence Hendley SCHOOL, 6th and Chesapeake Sts. S.E., WASH., D. C. D. C. Govt., Dir. Bldg. & Grounds, 499 Pa. Ave. N.W., Wash., D. C. Bids Dec. 19, awarded Dec. 30. CD 12/27, under LB.

SOUTH

BUILDINGS—BA

▲ **Tenn., Nashville**—STATE CAPITOL—BA 1/30—Tenn. State Bldg. Comn., Nashville, state capitol bldg. imprvs., incl. tunnel from Charlotte Ave. to buildings' basement and installing elevators. $1,500,000. CD 11/14.

HEAVY CONSTRUCTION—LB & CA

▲ **FLORIDA**—State Rd. Dpt., Tallahassee,
H. E. Wolfe Constr. Co., Box 1361, St. Augustine, Fla., CA $1,523,903 (9 bidders) limerock base, b. conc. surf. course binder, small drainage structures 11.639 mi. SR 25, Job. 2601-110, Alachua Co. Bids Nov. 26, awarded Jan. 8. CD 12/2, under LB.

▲† **Hendry Corp.**, Rattlesnake, Fla., CA $1,180,941, dredging 7,291,000 cu. yd. channel thru Devil's Swamp, Baton Rouge Harbor, East Baton Rouge, CIVENG-16-047-58-718, LOUISIANA. U. S. Eng., foot of Prytania St., New Orleans, La. Bids Nov. 8. CD 12/3, under LB.

▲ **Farnsworth & Chambers**, 3601 Brock St., Houston, Tex., LB $2,474,000 (10 bidders) base project new Nashville AIRPORT, NASHVILLE, TENN. Nashville Aviation Comn., City Hall, Nashville, Tenn. Donald Steinbaugh, 3rd Natl. Bank Bldg., Nashville, Tenn., archt. Bids Jan. 8. CD 11/19.

BUILDINGS—LB & CA

▲† **Albert Gersten & Assoc.**, 404 N. Rosbury Dr., Beverly Hills, Calif., CA $16,586,284. 1,100 unit Armed Services HOUSING, U. S. Marine Corp. Auxiliary Air Station, NBy 13909, BEAUFORT, S. C. Dist. P. Wks. Office, Bldg. No. 13, U. S. Naval Base, Charleston, S. C. Bids Oct. 4, awarded Jan. 9. CD 10/9, under LB.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction
(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England	**Middle West**
Middle Atlantic	**West of Mississippi**
South	**Far West**
PROPOSED WORK	
Water Supply	**Public Buildings**
Sewers, Waste Disposal	**Mass Housing**
Bridges	**Commercial Buildings**
Streets & Roads	**Industrial Buildings**
Earthwork, Waterways	**Unclassified**

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.
SOON LETS CONTRACT: SLC

LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

CD dates shown are of Construction Daily Issue in which last previous report was published.

OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

†	Federal Government
▲	Project of $1,000,000 or over.
ENR	Engineering News-Record
CD	Construction Daily

For additional reports see Construction Daily.

Pittman Constr. Co., Box 8116, New Orleans, La., CA $969,900, Proj. La. 4-4, Low-Rent HOUSING, LAKE CHARLES, LA. Lake Charles Housing Auth., Lake Charles, La. Bids Dec. 5. CD 12/12, under LB.

Johnson & Galyon, 1925 Broadway N.E., Knoxville, Tenn., CA $841,995, LIBRARY addn., KNOXVILLE, TENN. University of Tennessee, Knoxville, Tenn. Barber & McMurry, 2505 Kingston Pike, Knoxville, archts. CD 6/25/53.

MIDDLE WEST

BUILDINGS—BA

▲ **O., Cincinnati**—HOME FOR AGED—BA 1/29—Bethesda Hospital, Oak and Winslow St., 3 and 4 story, brick, rein.-con. home for aged addns., alterations, Lafayette Ave. $1,200,000. Sam Hannaford & Son, Dixie Terminal, archts. CD 8/22.

▲ **O., Painesville**—POWER PLANT BOILER—BA 2/10—City, City Hall, boiler at municipal power plant. $1,375,000. R. Ralph Hadlow, Hippodrome Annex, Cleveland, Zone 15, engr. CD 1/2/57.

HEAVY CONSTRUCTION—LB & CA

▲ **National Concrete Fireproofing Co.**, Terminal Tower, Cleveland 15, O. LB $1,686,007, est. $2,000,000. (6 bidders), Contr. 5, sewage treatment plant addns., sludge digestion and disposal facilities, EUCLID, O. City, City Hall, Euclid, O. Bids Jan. 6. CD 12/16.

▲ **MICHIGAN**—State Hy. Dpt., John C. Mackie, comr., Stevens T. Mason Bldg., Lansing. Bids opened 1/8, **Cooke Contg. Co.**, 116 Penobscot Bldg., Detroit, Mich. LB $1,424,946, est. $1,620,000. grading, drainage, structures, surf., Service Road utility alterations 1.93 mi. Edsel Ford Expressway from Norcross to Bedford Aves., Detroit, BI 82025 C18-UN (I 09-1 43) Interstate Sys. Proj. FAH Act 1956, Wayne Co. CD 12/30.

BUILDINGS—LB & CA

▲ **The Austin Co.**, 16112 Euclid Ave., Cleveland 12, O., CA $1,000,000, design and contract General OFFICE AND RESEARCH BLDG., Shaker Blvd., CLEVELAND, O. Tremco Mfg. Co., 8701 Kinsman Ave., Cleveland 4, O. Awarded Jan. 7. CD 12/24.

▲ **Morris Skilken & Co., Inc.**, 696 E. Broad St., Columbus, O., CA $5,000,000, 62 unit SHOPPING CENTER, with 300,000 sq. ft. parking for 2,500 cars, NORTH OLMSTED, O. Saul Biskind, 4511 Brookpark Rd., Cleveland 29, O. Awarded Jan. 6. CD 10/11/56.

▲ **Babcock & Wilcox**, 161 E. 42nd St., New York, N. Y. CA $1,250,000. CARBON MONOXIDE FIRED BOILER, at refinery, TOLEDO, O. Standard Oil Co. of Ohio, Midland Bldg., Cleveland, O. CD 5/15/51.

▲† **American Machine & Foundry Co.**, 261 Madison Ave., New York 16, N. Y., automated shell-filling line, at ORDNANCE PLANT, JOLIET, ILL. Procurement Office, Joilet Ordnance Plant, Joliet, Ill. CD 4/10/52.

WEST OF MISSISSIPPI

BUILDINGS—BA

Tex., Dallas—PARKING—BA 1/30—Exchange Parking Co., c/o Lane, Gamble & Assocs., archts., 434 Exchange Bank Bldg., 2 story, 300x585 ft., first parking structure, $500,000-$1,000,000. Lane, Gamble & Assocs., 434 Exchange Park Bldg., c/o Wm. K. Hall & Co., 435 Exchange Bank Bldg., engrs.

HEAVY CONSTRUCTION—LB & CA

▲ **Northern States Power Co.**, A. S. King, pres., 15 South Fifth St., Minneapolis, Minn., Owner Builds, $623,000, constr. new source power supply to Bird Island-Brownton area, (transmission line and sub-station at one or other place) Minneapolis; $125,000, constr. 10.5 mi. 23,000 volt line from Hugo sub-station to Forest Lake, Minneapolis; $837,000, constr. Oak Park sub-station, Stillwater, MINNESOTA. Grand total $1,585,000.

▲ **IOWA**—State Hy. Comn., Ames, Bids opened 1/7, **Iowa—F. A. Moser**, Farmersburg, Iowa and **Christensen Bros.**, Cherokee, Iowa, LB $202,083, 25 rein.-con. box arch and pipe culverts and extensions; LB $118,608, triple 15 ft.-18 ft.-15x12x189 ft. rein.-con. box culvert; LB $110,745, twin 121 ft. 8 in. x 40 ft. pretensioned prestressed concrete beam bridge; LB $140,877, 155 x 28 ft. pretensioned prestressed concrete beam bridge at various locations on Interstate Rte. 1 from near east line, Sec. 1-77-33 east to near center, Sec. 6-77-31, I-01-2(4), all foregoing in Adair Co.;
Iowa—Cunningham-Reis Co., 440 Insurance Exch. Bldg., Des Moines, Iowa, LB $561,564, 30 ft. x 984 ft. continuous welded girder bridge on relocation of Iowa 60 over Des Moines River on west line NW¼ Sec. 30-81-25, FN-1104, Dallas and Polk Counties;
Iowa—Welden Bros., Iowa Falls, Iowa, LB $972,726, 58 x 546 ft. multispan continuous plate girder bridge on relocation of Iowa 5 in Fort Dodge, near 1st St. S.W. between 10th and 11th Aves. S.W., FN-13, Webster Co. CD 12/26.

▲† **Hyde Constr. Co.**, 1804 N. Mill St., Jackson, Miss. and **Cook Constr. Co.**, Hy. 80 W., Jackson, Miss., LB $3,318,432, constr. Fort Cobb Dam, Washita Basin Proj., near FORT COBB, Spec. DC 4988, OKLAHOMA.

(Continued on page 92)

Steel H-Piles for Connecticut Turnpike

When completed, the half-billion dollar Connecticut Turnpike will include 274 important bridge structures along its 129-mile length. There will be 198 bridges and viaducts over rivers, highways and railroads, eight of them high-level bridges. Another 76 bridges and viaducts will carry other facilities over the Turnpike.

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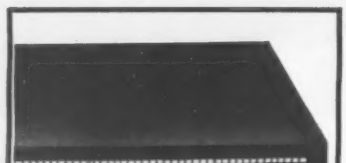

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QUAKER RUBBER DIVISION

(Continued from page 90)

Bureau Reclamation, Dpt. Interior, Anadarko, Okla. Bids Jan. 9. CD 12/5.

BUILDINGS—LB & CA

▲ **The Fluor Corp.,** Houston Club Bldg., Houston, Tex., CA $2,250,000, design and construct, gas processing PLANT, $100,000, plant equipment and storage bldg., near TILDEN, TEX. Transcontinental Gas Pipe Line Corp., 3100 Travis St., Houston, Tex. Grand total $2,440,000 CD 1/9.
Transcontinental Gas Pipe Line Corp., Owner Builds, $90,000, gas lines in vicinity of plant (Tilden, Tex.).

FAR WEST

HEAVY CONSTRUCTION—LB & CA

▲ **ARIZONA**—State Hy. Dpt., Phoenix,
Fisher Contg. Co., Box 6306, Phoenix, Ariz. CA $2,424,502, est. $2,648,296. select material aggreg. base, bit. plant mix and seal coat 9.4 mi. U. S. Rte. 66 toward Holbrook, I-008-5 (6) Navajo Co. Bids Dec. 20. CD 1/3, under LB.

▲† **Donald M. Drake Co.,** 1600 N.W. Savier St., Portland, Ore., CA $2,681,004, est. $3,126,841, earthwork, concrete canal lining, and structures for Esquatzel diversion canal, Sta. 0 plus 82, Schedules 1 and 2, Columbia Basin Proj., DC-5000, WASHINGTON. Bureau Reclamation, Dpt. Interior, Ephrata, Wash. Bids Dec. 19, awarded Jan. 8. CD 12/31, under LB.

▲ **CALIFORNIA**—State Div. Hys., 1120 N St., Sacramento,
Fredrickson & Watson Constr. Co. and Ransome Co., 873 81 Ave., Oakland, Calif. CA $7,620,605. grading roadway, surf. with c. conc. and plant mix surf., 3 steel, rein.-con. bridges and 8 rein.-con. bridges, hy. lighting, steel sign structures, truck scale house and facilities, 8.8 mi. between 1.4 mi. west of Junction Rtes. 37 and 38 and 0.5 mi. west of Boca near Truckee, Nevada Co. Bids Dec. 18. CD 12/23, under LB.

BUILDINGS—LB & CA

▲ **James I. Barnes Constr. Co.,** 1119 Montana Ave., Santa Monica, Calif. LB $3,137,180. (3 bidders), general construction, 5 story bsmnt., 201,000 sq. ft. total area of 4 OFFICE floors addition, 2 parking floors, Div. of Highways, District VII Office Bldg., LOS ANGELES, CALIF. State Div. Architecture, 1100 S. Grand Ave., Los Angeles, Calif. Bids Jan. 8. CD 12/6;
A. S. Schulman Electric Co., 641 Imperial St., Los Angeles, Calif. LB $730,000. (11 bidders), electrical work for District VII office bldg. addn. (Los Angeles, Calif.):
State Plumbing & Heating Co., 49249 Exposition Blvd., Los Angeles, Calif. LB $595,000. (6 bidders), air conditioning and heating work for District VII Office bldg, addn. (Los Angeles, Calif.).

CANADA

HEAVY CONSTRUCTION—LB & CA

▲ **McNamara Constr. Ltd.,** 348 Dominion Sq. Bldg., Montreal, Que., CA $2,172,821 (6 bidders) 4th section Decarie-Raimbault Collector Sewer, between Decarie Blvd. and Stinson St., MONTREAL, QUE. City, City Hall, Montreal, Que. Bids Oct. 23. CD 10/30, under LB.

BUILDINGS—LB & CA

▲ **Commonwealth Constr. Co., Ltd.,** 300 Royal Bank Bldg., Winnipeg, Man., CA Est. $2,000,000 (11 bidders), superstructure 15,000 sq. ft. DEPARTMENT STORE, on 15 acre site, adjacent to Polo Park Shopping Center, WINNIPEG, MAN. Simpson-Sears Ltd., 176 Yonge St., Toronto, Ont., and 421 Portage Ave., Winnipeg, Man. Bids Dec. 17, awarded Jan. 6. CD 12/4.

▲ **Gerard Beaudet Constr. Co.,** near 2285 Nicholas Perrot Ave., Montreal, Que. Owner Builds. $2,500,000, HOUSING PROGRAM, Roxboro, MONTREAL, QUE.

PROPOSED PROJECTS

WATER SUPPLY

▲ **Que., Montreal**—City, City Hall, constr. 50 m.g. resevoir, Rosemount, Beaubien and Bellechasse, and 16th and 18th Aves. $3,250,000. CD 9/13/44.

SEWERS, WASTE DISPOSAL

▲ **Ind., Marion**—City, Bd. Wks., sewer expansion program, doubling size of present sewage disposal plant, installing 40 mi. 8 to 96-in. storm and sanitary sewers. $7,700,000. Consoer, Townsend & Assocs., 360 E. Grand St., Chicago, Ill., consult. engrs. (Correction—status). CD 10/25, under CA.

▲ **N. Y., Mineola**—Bd. Supervs. Nassau Co. Old County Court House, Mineola, sewage facilities in collection district that covers Williston Park, East Williston, Albertson, North Hills and Roslyn Estates. $8,000,000. To go ahead in 1958. CD 8/16/56.

▲ **Pa., Red Hill**—Red Hill-Pennsburg-East Greenville Sewage Auth., Red Hill, sewerage sys. and treatment plant, $1,610,000. Bids soon, Albright & Friel, Penn Center Plaza, Phila., consult. engrs.

▲ **Tex., San Antonio**—City, City Hall, storm drainage Springsdale Project $427,000 storm drainage near Avant, Nopal and S. Pine Sts. $2,455,000 Gullatt, Lodal & Assocs., 1411 Transit Tower, San Antonio, consult. engrs. storm drainage. Olympia and Bass Rd. south to Alazan Creek $225,000, storm drainage between McNeel Rd. and Eppler St., $150,000, sanitary

sewers in Montcello Park and between Weizemann and Dawnview on Near St. $75,000, Terrell Bartlett Engineers, Bedell Bldg., consult. engrs. CD 10/29.

▲ Wis., **Milwaukee**—Metropolitan Sewerage Comn. of City of Milwaukee, and Metropolitan Sewerage Comn. of County of Milwaukee, Jones Island, sewage treatment plant and intercepting sewers, $50,000,000, Alvord, Burdick & Howson, 20 N. Wacker Dr., Chicago, Ill., consult. engrs. Raymond S. Leary, c/o owner, ch. engr. CD 12/28/56.

STREETS AND ROADS

▲ N. J., **Paterson**—Bd. Freeholders Passaic Co. Court House, reconstr. major streets in Paterson, Clifton, Haledon, Little Falls, Wayne, Hawthorne and W. Milford particularly roadways in trolly track area on Main St., Market St. and Crooks and Vreeland Aves., over 3 year period, $1,586,000. George Mason, Court House, engr.

▲ Wis., **Milwaukee**—City, City Hall, paving program for 1958, $3,500,000. E. A. Schmidt city engr.

EARTHWORK, WATERWAYS

▲ Calif., **Sacramento**—Sacramento Municipal Utility Dist., 2101 "K" St., Ice House Dam and reservoir, Junction Dam and Reservoir, Camino Dam, Jaybird Tunnel and powerhouse various locations, Upper American River, $8,187,792. Constr. to start 1958. Bechtel Corp., 220 Bush St., San Francisco, consult. engrs. CD 12/8/55.

▲ Tex., **Port Arthur**—City, City Hall, seawall proj., sheet-pile bulkheading of existing structure, $5,985,000; rip-rapping of toe of existing seawall, $500,000; exten. of earthen levee, $77,000, Robert J. CUMMINS, c/o Bankers Mtg. Bldg., Houston, consult. engr. CD 3/20/56.

AIRPORTS

▲† Me., **Presque Isle**—MISSILE LAUNCHING FACILITIES—Strategic Air Command, Dpt. Air Force, Pentagon, Wash. 25, D. C., plans by Grad, Urbahn & Seelye, consult. engrs.-archts., 210 Greenwich St., New York, N. Y., facilities for launching site for intercontinental missiles, near here. Over $1,000,000. CD 11/13, under United States.

▲ Okla., **Oklahoma City**—AIRPORT—City, Earl M. Simon, city clerk, City Hall, extend N/S Runway, Taxiways Terminal Apron, $1,651,080; strengthening runways and taxiways, $1,637,200; aprons and car parking for hangars and Air Cargo areas, $1,209,910; lrge Maintenance Hangar, $850,000; Air Mail, Air Express and Air Cargo Bldgs., $640,000 strengthening existing Terminal and Hangar Aprons, $588,200; Airport Water and Sewer mains, $500,000; General Aviation Hangar, $250,000; Terminal Bldg. imprvs., addn., $243,000; Airport Fueling Systems, $224,300; terminal auto parking, fencing and Airport Perimeter Road, $224,300, above work for Will Rogers Airfield. CD 12/26.

▲† Wyo., **Cheyenne**—BALLISTIC MISSILE SITE, etc.—Omaha C. of E., 1709 Jackson St., Omaha, Neb., plans by Holmes & Naver, Inc., 838 S. Figueroa St., Los Angeles 17, Calif., ballistic missile site missile launching, storage and supporting facilities. $65,000,000. CD 11/26.

▲ Que., **Dorval**—AIR BASE IMPRVS.—Trans-Canada Air Lines, International Aviation Bldg., Montreal, overhaul and maintenance base for turbine-powered aircraft, incl. overhaul hangar, maintenance hangar, office nd warehouse, parking areas and taxiways, $20,000,000. Constr. Spring 1958.

FOREIGN

▲ **Morocco, Casablanca**—PLANT—General Tire & Rubber Co. of Morocco (The General Tire & Rubber Co., 1708 Englewood St., Akron, O., U.S.A.), Casablanca, plans tire mfg. plant. $15,000,000.

PUBLIC BUILDINGS

▲ Calif., **Arcadia**—SCHOOL—Arcadia School Dist., Arcadia, bond election Feb. 11, Junior High School on 17½ acre site, conversion 1st Ave. and Dana Schools to Junior High Schools, 6 room bldg. at Highland Oaks School, District Library and 1st Admin. Bldg. $3,885,500.

▲ Calif., **Campbell**—SCHOOL—Campbell Union High School Dist., 151 N. Winchester Rd., plans by Clark, Stromquist, Potter & Ehrlich, 3200 Hanover St., Palo Alto, high school. $2,500,000. CD 2/13.

▲ Calif., **Costa Mesa**—WARD, etc.—Calif. State Div. Architecture, 1100 S. Grand Ave., Los Angeles, ward bldgs., $1,297,400, Bids about June 1; library, occupational therapy, canteen and barbershoo bldg., $543,000, Bids in September; auditorium, $377,000, Bids in September; recreation field for school, $87,000, Bids in June; addnl. boiler and controls, $85,300, Bids in September, above work at Fairview State Hospital, State Dpt. Mental Hygiene. CD 2/3/56.

▲† Calif., **Hamilton Air Force Base**—APARTMENTS—Procurement Officer, Hamilton Air Force Base, Calif., plans by E. L. Norberg, 407 Occidental Ave., Burlinghame, and David Coleman, Orinda, 550-unit frame duplex and garden apartments. $9,000,000. Wilsey & Ham, 10 Vivian Court, San Rafael, consult. engrs.

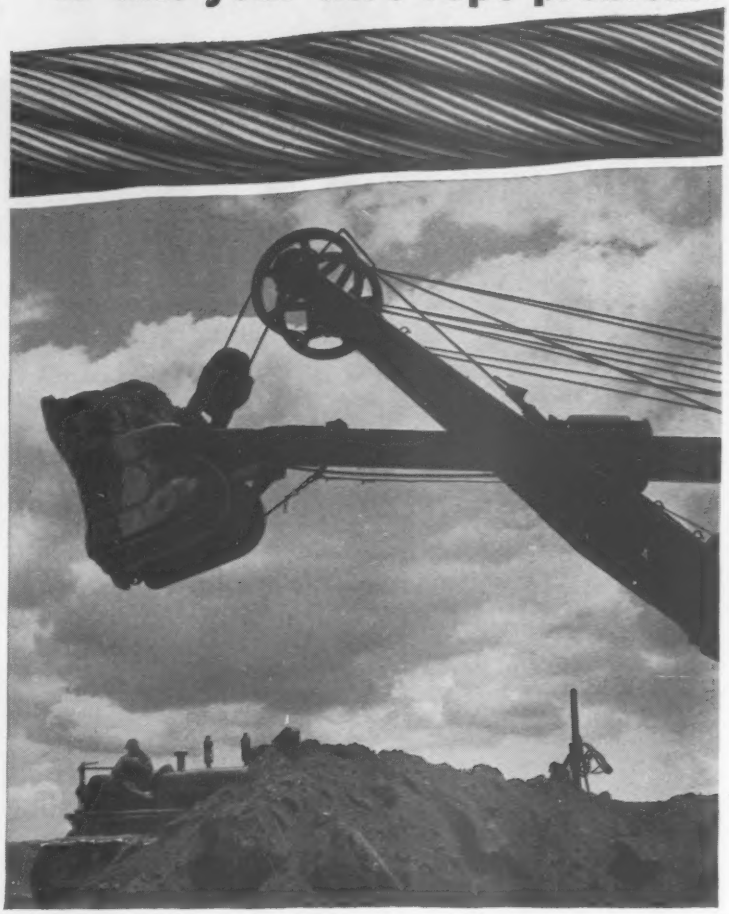
▲ Calif., **Los Angeles**—CORRECTIONAL SCHOOL—Bd. Supervs. Los Angeles Co., Hall of Records, plans by Samuel E. Londen & Assocs., 598 S. Spring St., 64,148 sq. ft. Girls Correctional School. $1,750,000. CD 11/9/56.

▲ Calif., **Los Padres**—MEDIUM SECURITY FACILITY—Calif. Div. Architecture, 1100 S. Grand Ave., Los Angeles, Medium Security Facility at California

(Continued on page 96)

bending fatigue...

is this your wire rope problem?



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To beat the competition and still make money on low bids, you can depend on Manitowoc to move more yardage for you at the lowest cost per yard. Here's why . . . every Manitowoc unit has fewer moving parts . . . simpler design . . . than any rig in the field today. No Manitowoc excavator has more than 17 gears or pinions in the entire machine . . . most Manitowocs have less! An exclusive slide pinion arrangement eliminates all wasted power because only working gears turn. You add power by saving power.

Because no other excavator is as simple as a Manitowoc, you get faster working cycles, greater output each shift and less downtime . . . more working time to finish jobs ahead of schedule. In addition to greater speed, every unit gives you an extra measure of performance . . . providing bonus output well above rated capacities. You can tackle the toughest jobs with confidence.

Let Manitowoc beef-up your profit margin this year . . . make more money for you even on the low-bid contracts. There's a complete range of Manitowoc rigs (see table below) to match any job . . . call your Manitowoc distributor today for the full, profitable story.

Manitowoc Engineering Corp., Manitowoc, Wis.

there's a cost-saving Manitowoc to make any low bid profitable

	SHOVEL	CRANE	DRAGLINE	TRENCH HOE
model **1600**	1 yd.	20 Ton	1 yd. to 1¼ yd.	1 yd.
model **2000**	1¼ yd.	25 Ton	1¼ yd. to 1½ yd.	1¼ yd.
model **2800** mobile crane	.....	40 Ton	2 yd. to 2¼ yd.	.....
model **3000**	2 yd.	40 to 50 Ton	1¾ yd. to 2¼ yd.	2 yd.
model **3500**	2½ yd.	60 Ton	2 yd. to 2½ yd.	.....
model **3900**	.....	60 to 80 Ton	3 yd. to 3½ yd.	.....
model **4500**	5½ yd.	100 Ton	4 yd. to 6 yd.	.....

Manitowoc

MANITOWOC ENGINEERING CORP.

MANITOWOC, WISCONSIN

CRANES	SHOVELS	DRAGLINES	TRENCH HOES
20 TON - 100 TON	1-YD. - 5½-YD.	1-YD. - 6-YD.	1-YD. - 2½-YD.

(Continued from page 93)

Men's Colony, State Dpt. Correction. $13,633,600. Bids about June 1.

▲ **Calif., Norkwalk**—WARD, etc.—Calif. State Div. Architecture, 1100 S. Grand Ave., Los Angeles, ward bldgs., $2,293,950. Bids in September; remodel administration bldg. and other old structures, $816,400. Bids in July; addnl. boiler plant facilities, $94,150. Bids in July, above work at Metropolitan State Hospital, State Dpt. Mental Hygiene. CD 1/14/55.

▲ **Calif., Palm Springs**—SCHOOLS—Palm Springs Unified School Dist., Palm Springs, voted bonds Dec. 10, elementary school, school addns., etc. $2,138,000. CD 2/23/55.

▲ **Calif., Pomona**—RESIDENCE HALLS, etc.—Calif. Div. Architecture, 1100 S. Grand Ave., Los Angeles, residence halls at Kellogg-Voorhis Campus, California State Polytechnic College, $3,087,500. Bids in June; library bldg., $1,446,550. Bids in March; business classroom bldg., $693,000. Bids in March; completion of agricultural units, $457,700. Bids in April; corporation yard, $287,900. Bids May 1, all above work at Californa State Polytechnic College.

▲ **Calif., Redwood City**—ADMINISTRATION—San Mateo Co., c/o County Mgr., Courthouse, County Administration Bldg. $1,678,100.

▲ **Calif., Sacramento**—ENGINEERING, etc.—State Div. Architecture, 1120 N St., engineering bldg. $1,789,000. Bids about Apr. 1; boiler addn. $63,630. Bids probably in February. Above work at Sacramento State College.

▲ **Calif., San Diego** — ADMINISTRATION — State Div. Architecture, 1100 S. Grand Ave., Los Angeles, administration bldg. addn., San Diego State College. $1,030,500. Bids in September. CD 6/3/55.

▲ **Calif., San Bernardino**—OFFICE—State Div. Architecture, 1100 S. Grand Ave., Los Angeles, office bldg. for Dist. VIII, State Div. Hys. $1,500,000.

▲ **Conn., New London**—SCHOOL—Town, Town Hall, plans by Lyons, Mather & Grieshaber, 154 Broad St., Junior High School, Colman St. $2,500,000. Englehardt, Englehardt, Leggett & Cornell, 221 W. 57th St., New York, N. Y., consult. engrs. CD 7/10.

▲ **Conn., West Haven**—SCHOOL—Town, plans by Polack & Sullivan, 1397 Chapel St., New Haven, high school (Painter Park Site abandoned, new site to be chosen). $1,300,000. CD 5/31/56.

▲ **Ill., Winnetka**—PLANT—Village of Winnetka Electrical & Water Dpt., 510 Green Bay Rd., electric plant expansion, $6,000,000. Sargent & Lundy, 140 S. Dearborn St., Chicago, consult. engrs.

▲ **Ind., Fairbanks**—OFFICE, etc.—Indiana & Michigan Electric Co., 2101 Spy Run Ave., Fort Wayne, 2 story, 230x260 ft. structural steel, masonry office bldg; 1 story turbine room; 9 story boiler house. $2,500,000. Jean J. Casabona, 30 Church St., New York, N. Y. and American Gas & Electric Service, 30 Church St., New York, N. Y., engrs.

▲ **Md., Marlboro**—SCHOOL—Prince George's Co. Bd. Educ., Marlboro, plans by Paul H. Kea, 5109 Baltimore Ave., Hyattsville, high school, Glendale. $1,600,000.

▲ **Mich., Dearborn**—CIVIC AUDITORIUM—City, Orville L. Hubbard, mayor, bond election June 9, 6,500 seat capacity civic auditorium. $3,500,000.

▲ **Mich., Houghton**—APARTMENTS—State, A. N. Langius, dir. State Bldg., Lew Cass Bldg., Lansing, plans by Ralph R. Calder, 1212 Kales Bldg., Detroit, Zone 26, apartments for Michigan College of Mining & Technology, $2,100,000. Federal loan $992,000 approved by Community Facilities Admin., Wash., D. C. CD 4/16/56.

▲ **Mo., Cape Girardeau**—DORMITORY, etc.—Southeast Missouri State College, Bd. Regents, Cape Girardeau, plans by Paul Buchmueller, Sikeston, dormitory and dining hall for college. $1,400,000. CD 2/2/56.

▲ **N. J., Irvington**—HOSPITAL—Irvington General Hospital, 832 Chancellor Ave., hospital addn. $1,500,000. CD 8/9.

▲ **N. J., Vineland**—SCHOOL—Bd. Educ., defeated bonds Dec. 10, high school. $4,400,000. Ralph E. Hacker, 854 River Rd., New Milford, archt. CD 11/8.

▲† **N. M., Albuquerque**—FEDERAL—General Services Admin. P. Bldgs. Service, Wash. 25, D. C., plans by Flato, Moore, Bryan & Fairburn, Ferguson, Stephens & Assocs., 511 Amhurst Dr. S.E., 8 story, bsmnt. and penthouse federal bldg. $2,000,000-$3,500,000. Bids about 4/7.

▲ **O., Adams**—SCHOOLS—Bd. Educ., Carl J. Ramus, supt., 1800 Krieger Dr., Toledo, bond election May 6, Junior High School, new Grade School, addns. to present bldgs. $2,280,000.

▲ **O., Columbus**—HOSPITAL—Franklin County Hospital Comn., Court House, 350-bed addn. to Grant Hospital. $6,000,000. CD 9/19/56.

▲ **Pa., New Kensington**—SCHOOL—Auth. School Dist. of Lower Burrell Twp., New Kensington, plans by Enos Cooke, 316 Charles St., Junior High School, Puckity Church Rd. $1,500,000.

▲ **Wash., Everett** — SCHOOL — School Dist. No. 2, Everett, $1,800,000 bond election Mar. 11, and 10-mill special levy to raise an addnl. $600,000, high school. $2,173,879.

▲† **Wash., Richland**—PLUTONIUM RECYCLE TEST REACTOR—Atom Energy Comn., 1901 Constitution Ave. N.W., Wash. 25, D. C., construction and engineering projects at Hanford works, incl. plutonium recycle test reactor, $6,000,000; pilot plant for test reactor program, $2,000,000; developing plutonium production reactor, $3,000,000 and community imprvs. in Richland, $700,000, total est. $25,000,000 for 1958. CD 6/30/52.

COMMERCIAL BUILDINGS

▲ **Calif., Hollywood**—CENTURY CITY—Twentieth-Century Fox Studios, Hollywood, plans by Welton Becket & Assocs., consult. engrs.-archts., 5657 Wilshire Blvd., Los Angeles, constr. Century City, incl. ten 6 to 20 story apartments and offices, hotel, department store, museum, motion picture arts bldg. and 75 ft. wide highway. Total est. $400,000,000. Work to start in 6 months.

▲ **Calif., San Francisco**—HOSPITAL EXPANSION—Franklin Hospital Bd. Directors, 14 and Moe Sts., plans by Stone, Mulloy, Marraccini & Patterson, 615 California St., general expansion of Franklin Hospital facilities. $8,000,000. CD 3/28.

▲ **Calif., San Francisco**—OFFICE, etc.—Jack Tar Hotels, Charles A. Sammons, 6 St. and Boulevard, Galveston, Tex., plans by Thomas M. Price, 1227 "L" St., Galveston, Tex. and Hertzka & Knowles, 85 Post St., San Francisco, Calif., 8 story hotel, 12-story office bldg. garage, rein.-con. porcelain enamled steel curtain walls, $10,000,000. R. L. Reid, Inc., 2506 Richton St., Houston, Tex. and Graham & Hayes, 417 Market St., San Francisco, structural engrs. Joe A. Poole, 2506 Richton St., Houston, Tex., and Buonaccorsi & Murray, 350 Mission St., San Francisco, mech. and electrical engrs. Bids in February. CD 12/31/56.

▲ **Ill., Chicago**—APARTMENT—7337 S. Shore Drive Corp., c/o Dubin & Dubin, archts., 140 N. Dearborn St., 12 story apartment, 7331 South Shore Dr. $4,100,000.

▲ **Iowa, Council Bluffs**—HOSPITAL—Jennie Edmundson Memorial Hospital, Mrs. Clara E. Strohbehn, pres. bd., Oak and Pierce Sts., plans by Leo A. Daly Co., 633 Insurance Exchange Bldg., Omaha, Neb., 4 story hospital. $2,125,000. CD 1/20/54.

▲ **Md., Towson**—COLLEGE CENTER, etc.—Goucher College, Dulaney Valley Rd., Zone 4, constr. College Center, Chapel, Student Activities Bldg., Wing for Gymnasium, Maintenance & Service Center. $2,500,000. CD 6/24, under Md., Baltimore.

▲ **Mass., Waltham**—ADMINISTRATION—Brandeis University, Dr. Abram L. Sachar, pres., 415 South St., plans by Hugh A. Stubbins Assoc., 806 Mass. Ave., Cambridge, administration bldg. on campus. $1,150,000. Bids in 5/6 months. CD 2/1.

▲ **Mich., Ecorse**—STORE—Montgomery Ward Co., 15400 Grand River, Detroit, plans by Charles N. Agree, Inc., 14330 West McNichols Rd., Detroit,

(Continued on page 98)

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TRU-LAY VHS is a new grade of wire rope, 15% stronger than Improved Plow Steel which has been the top grade up to now. It is also tougher and more resistant to abrasion. It was introduced three years ago and recommended for only the hardest jobs such as scrapers, dozers, draglines, shovel hoists, logging chokers and rotary drilling.

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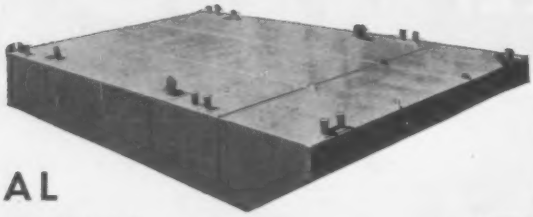

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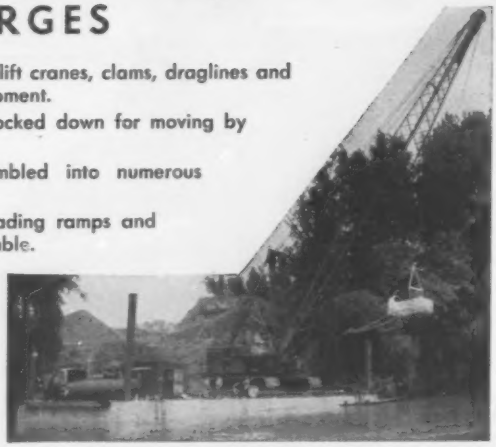

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(Continued from page 96)

2 story, 150,000 sq. ft. brick, white stone pillars, store, gas station and service facilities, Eureka and Trenton Rds. $1,500,000. Constr. in Spring.

▲ **N. Y., Amherst**—HOMES—M. J. Peterson, Inc., 860 Englewood Ave., Buffalo, Zone 23, and Charles Climo Homes, Inc., 163 Breckenridge St., Buffalo, Zone 13, 700 homes, on 300-acre tract incl. sewage plant, and new streets. $15,000,000.

▲ **N. Y., Bronxville**—LIBRARY, etc.—Sarah Lawrence College, 1 Meadway, plans by Philip Johnson, 219 E. 44 St., New York, library, plastic arts studio, music building and dormitory. $4,000,000.

▲ **N. Y., Brooklyn**—COOPERATIVE HOUSING—Highlawn Terrace, Inc., c/o Civil Service Technical Guild Local 375, 5 Beekman St., New York, Zone 7, middle income co-operative project on north side of Avenue "T" between W. 4 St. and W. 5 St. two 8 story buildings for 124 families to be called "Highlawn Terrace". $1,883,330.

▲ **N. Y., Brooklyn**—APARTMENT, etc.—Len Operating Co., 16 Court St., Zone 2, plans by Morris Rothstein & Son, 186 Joralemon St., Zone 2, 6 story, 254-family apartment and 137-car garage 9201-27 Shore Rd., $2,500,000.

▲ **O., Cleveland**—APARTMENTS—Owner c/o Robert Jaffe, Hippodrome Bldg., Zone 14, plans by Irving D. Robinson, 4900 Euclid Ave., Zone 3, eighteen 3 story apartments, Lake Shore Blvd. east of Nottingham Rd. $3,000,000.

▲ **Okla., Oklahoma City**—BANK—Tenth Federal Reserve Bank, 226 N.W. 3rd St., Oklahoma City, Okla., plans by Sorey, Hill & Sorey, 809 N. W. 36th St., Bank Addn. $2,000,000. CD 8/28.

▲ **Okla., Tulsa**—HOSPITAL, etc.—Wm. K. Warren Foundation, c/o Mrs. Wm. K. Warren, pres. Warren Petroleum Corp., 1340 S. Boulder St., plans by Schmidt, Garden & Erikson, 104 S. Michigan, Chicago, Ill., and F. M. Olston, Nidco Bldg., (first half of overall proj.) St. Francis Hospital, Y-shaped, and facilities, $4,500,000, Bids in February; (second half of overall proj.) hospital expansion convent, chapel and allied facilities, $3,500,000 (proj. will begin after first ½ is completed.)

▲ **Tex., Arlington**—HOTEL, etc.—North Texas Development Corp., F. L. Eddins, pres., Suite 6, 210 W. Main St., plans by Cole Smith, 5622 Dyer St., Dallas, hotel, $1,400,000; shop arcade, $350,000; office, $1,250,000. CD 12/17.

▲ **Tex., Houston**—STORE EXPANSION—Henke & Pillot Div. of Kroger Co., 3021 Washington St., store expansion, $1,750,000. Constr. in 1958. CD 8/11/48.

▲ **Tex., Lubbock** — CHURCH, etc. — St. Elizabeth's Catholic Church, 2305 Main St., church, convent, and rectory, $2,500,000.

▲ **Que., Metabetchouan**—SEMINARY—Le Seminaire Marie-Reine du Clerge plans by Jacques Coutu, 110 est rue Racine, Chicoutimi, 1½ story, 200 x 400 ft., seminary, concrete fdn., tar and gravel roof, $1,500,000. W. J. MacKay, 406 rue Mellon, Arvida, consult. engr.

INDUSTRIAL BUILDINGS

▲ **Calif., San Leandro** — WAREHOUSE, etc. — Sears Roebuck Co., S. State and Van Buren Sts., Chicago, Ill., 250,000 sq. ft. warehouse, office and service facilities. $2,500,000. Bids about March 1.

▲ **Ky., Louisville**—PLANT—Stauffer Chemical Co., Camp Ground Rd., hydrofluric acid plant. Over $1,000,000. CD 10/11/55.

▲ **Tex., Pleasanton**—PLANT—Lone Star Producing Co., c/o South Texas bldg., San Antonio, natural gas treating plant, near here. $3,650,000; some pipe lines in vicinity of plant, $80,000.

▲ **Tex., Tilden**—PLANT, etc.—Transcontinental Gas Pipe Line Corp., 3100 Travis St., Houston, gas processing or treatment plant, near here, $2,250,000; plant equipment and storage bldg., near here, $100,000; some gas lines in area of processing plant, near here. $90,000. Fluor Corp. Ltd., Houston Club Bldg., Houston, consult. engrs. CD 1/12/50, under Texas and New York.

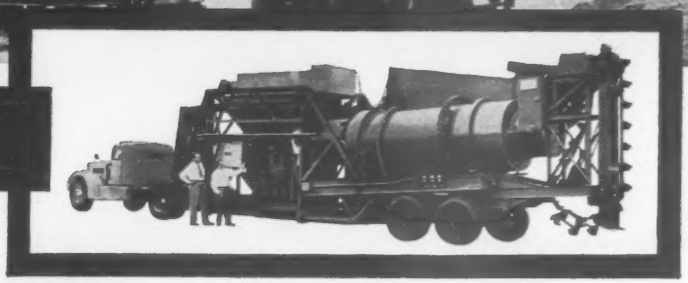
UNCLASSIFIED

▲ **Md., Baltimore**—ELECTRICAL DISTRIBUTION SYS., etc.—Baltimore Gas & Electric Co., Lexington Bldg., expanding, imprv. electrical distr. sys., incl. 8 substations, altering 7 existing sub-stations, $17,000,000; 2nd addn. 125,000 kw. generating capacity at Herbert A. Wagner Steam Generating Plant, $15,000,000; addns., imprvs. to gas sys., incl. 8.5 mi. 26 in. gas main to connect Manor Gate Station line to East Point Holder. $8,000,000. CD 8/2/51, under Consolidated Gas, Electric & Power Co. as owner.

▲ **New Mexico**—RURAL DISTRIBUTION LINES, etc.—Central Valley Electric Co-operative, Inc., Artesia, 113 mi. electric distr. line, 22 mi. 69 KV transmission line, 5 new sub-stations and sys. imprvs., Eddy Co. $1,084,000. CD 12/27/51.

▲ **Texas**—ELECTRIC DISTRIBUTION LINES—Lamb County Electric Co-operative, Inc., Littlefield, 24.5 mi. electric distr. lines; 2 new 3,750 KUA and 1 1,500 KVA sub-stations and system imprvs. $1,606,000.

▲ **Que., Montreal** — RACE TRACK IMPRVS. — Trans-Canada Funds Corp., c/o J. L. Levesque & Cie, 31 St. James St. W., Blue Bonnets Race Track, incl. enlargement of grandstand, constr. jockey club. $2,000,000.



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STANDARD Model T-M Trailer Mounted Asphalt Plants offer the same rugged design features as the larger STANDARD Model R-M Semi-portable Asphalt Plants, including: Super-Lift Dryer with Saw-Tooth Lifters . . . Heavy Duty Hi-Speed Mixer . . . Simplex Pushbutton Batching Control . . . Positive Control of Liquid Asphalt . . . Complete Accessibility. Field proven for a number of years, the Model T-M is designed for extreme portability and top capacity. Here's the largest, most economical Trailer Mounted Batch Type Asphalt Plant in the world.

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Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

BUILDINGS—BA

▲ **Me., Presque Isle**—HOSPITAL—BA 2/12—Presque Isle General Hospital, Second St., Arthur G. Gould Memorial Hospital, off Academy St. $1,346,325. Plans deposit $50. The Architects Collaborative, 63 Brattle St., Cambridge, Mass., archts. CD 1/7.

HEAVY CONSTRUCTION—LB & CA

▲ **Nanni Bldg. Co.,** 1415 Atwood Ave., Johnston, R. I., CA $1,426,700, est. $1,500,000, Bid 425-426, 427 and 428, RI Contr. 5701, 5702, 5703 and 5704, FA Proj. 9-37-004-06, terminal bldg., Theodore Green State Airport, HILLSGROVE, R. I. State, R. I. and Prov. Plants, Div. Purchase, State House, Providence, R. I. Bids Dec. 12. CD 12/17, under LB.

BUILDINGS—LB & CA

▲ **Stewart & Williams, Inc.,** 108 Arsenal St., Augusta, Me., CA Est. $2,000,000, HOSPITAL addn., LEWISTON, ME. St. Mary's General Hospital, 318 Sabbatus St., Lewiston, Me. Leo P. Provost, 61 Amherst St., Manchester, N. H., archt. Frank H. Whelan, 11 Beacon St., Boston, Mass., structural engr. Bids Dec. 18. CD 12/10.

▲† **John A. Volpe Constr. Co.,** 54 Eastern Ave., Malden, Mass., LB $6,696,000 est. $6,500,000, Armed Services HOUSING, consisting 395 Family Housing Units at Laurence G. Hanscom Field, Inv. Bids No. 19-604-58-40, BEDFORD, MASS. Contg. Officer, Air Force Cambridge Research Center, Laurence G. Hanscom Field, Bedford, Mass. Bids Jan. 14. CD 12/18.

▲ **Joseph Rugo, Inc.,** 581 Boylston St., Boston, Mass., LB $1,714,000, M-825 ADMISSIONS TREATMENT BLDG. for State Hospital, WESTBORO, MASS. Commonwealth of Mass., Dpt. Mental Health, c/o Div. Bldg. Constr., 38 Chauncy St., Boston, Mass. Bids Jan. 10. CD 12/11.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS

February 4, 11, 18 Maryland — February 4 New Jersey

BUILDINGS—BA

▲ **N. J., Thorofare** — SHOPPING CENTER, etc. — BA 1/30—Southwood Shopping Center, c/o B. Rostan, Lewis Tower Bldg., Phila., Pa., shopping center, supermarket, 5 and 10 cent store and 15 addnl. stores, $1,500,000, Cox & Guttman, 709 Market St., Camden, N. J. archts. CD 7/27.

▲† **D. C., Wash.**—AUDITORIUM, etc.—BA 2/19—General Service Admin., Public Bldg. Service, 19th and F. Sts. N. W., Auditorium, Fine Arts Bldg., (except elevators) Howard University. Appr. No. 75 x 1024, Proj. No. 49110, Contr. GS-R3-B-5916. Plans deposit $35; adv. ENR 1/23. CD 1/19/53.

▲ **N. J., Neptune**—SCHOOL—BA 2/19—Bd. Educ., Neptune Twp., Ocean Grove, high school, Ocean Grove, $1,500,000. Victor W. Ronfeldt, Browne Rd., Wayside, archt. CD 1/24.

▲ **N. Y., Chatham**—SCHOOL—BA 2/19—Chatham Central School Dist. No. 1, Chatham, elementary school. $1,500,000. Plans deposit $50. John H. Fisher, 29 Wendell Ave., Pittsfield, Mass., archt. CD 6/27/56.

▲ **N. Y., Fresh Meadows**—SCHOOL—BA 2/21—Bd. Educ., Bureau Constr., 42-15 Crescent St., Long Island City, Zone 1, general construction, plumbing and drainage, heating and ventilating, electrical work and lighting fixtures, electric passenger elevator, for Northeast Queens High School, North Hempstead Turnpike, Utopia Parkway, 59 Ave. and Fresh Meadow Lane. $6,894,000. Plans deposit $50 for general constr; Plans deposit $20 each for plumbing and drainage, heating and ventilating and electrical work and lighting fixtures; Plans deposit $5 for electric passenger elevator. CD 1/9/57.

▲ **N. Y., Uniondale**—HOME—BA 2/25—Nassau Co. Executive, Nassau Co., Old County Court House, Mineola, Contr. No. 1055-K1 general construction; Contr. 1055-K2, heating and ventilating Contr. No. 1055-K3 plumbing; Contr. 1055-K4, electrical; Contr. 1055-K5 sprinkler system County Welfare Home, Jerusalem Ave., Uniondale, Town of Hempstead. Plans deposit $75 for general contract $50 for others. CD 5/8/56.

▲ **N. Y., Greenlawn**—SCHOOL—BA 3/3—Bd. Educ., Greenlawn, Central High School. $2,000,000. Ketchum, Gina & Sharp, 227 E. 44 St., New York, Zone 17, archts. CD 10/24.

HEAVY CONSTRUCTION—LB & CA

▲ **NEW YORK**—Dpt. P. Wks., Gov. Alfred E. Smith State Office Bldg., Albany,

N. Y.—Fitzgerald Bros. Constr. Co., Inc., 92 Fourth St., Troy, N. Y. CA $568,105. wid'n., resurf. 1.75 mi. Rte. 9 in 2 sections for southerly intersection of Old Loudon Rd. northward to point about 1,900 ft. south of Latham Circle and from point about 2,300 ft. north of Circle northward to northern intersection of Old Loudon Rd. existing hy. sections now 30 ft. will be widened to 48 ft. and b. conc. resurf. Albany Co.;

N. Y.—Torrington Constr. Co., Inc., P.O. Box 336, 999 S. Main St., Torrington, Conn. CA $661,790. relocating portions of Rtes. 9, 9N and 22 in Keesville, incl. 3 span 225 ft. bridge over Ausable River, Clinton and Essex Counties;

N. Y.—Walter P. Blimm Co., Inc., 270 State Rd., Lockport, N. Y. CA $2,404,928. constr. 3.01 mi. section on West Ave. portion of Lockport's-East-West Arterial Rte., incl. relocation of ½ mi. portion of Upper Mountain Rd. and new bridge to carry the N.Y.C. R.R. over the new Upper Mountain Rd. alignment Niagara Co.;

N. Y.—Collins Brothers, Inc., 12 Tallmadge Pl., Mechanicville, N. Y. CA $1,684,146. 4-lane divided conc. 2.14 mi. Crosstown Connection Arterial Rte. access roads 0.88 mi. in Schenectady, all street intersections except State St. will be graded, State St. traffic interchange facilities, with State St. passing over connection at Rte. 7, Crosstown connection will be graded only, State St. Bridge over new connection will have curb to curb width of 54-in. flanked by 10 ft. wide sidewalk on each side, Schenectady Co. Grand total $5,318,965. Bids Oct. 31, awarded Dec. 4. CD 11/1, under LB.

▲ **J. D. Hedin Constr. Co.,** 2900 Newton St. N.E., Wash., D. C. CA $1,809,367. (10 bidders), Contr. F A, No. 1-03-1 (11), Southwest Freeway, 2nd St. to 4th St., grading, draining, retaining walls and underpass, WASH., D. C. D. C. Govt., Dpt. Hys., 499 Pa. Ave. N.W., Wash., D. C. Bids Dec. 9. CD 12/11, under LB.

BUILDINGS—LB & CA

▲ **V. B. Constr. Co., Inc.,** 737 Second Ave., New York, N. Y. CA $2,334,000. general contract, Freeport HIGH SCHOOL, Brookside Ave., FREEPORT, N. Y. Bd. Educ., Union Free School Dist. No. 9, Freeport High School, Freeport, N. Y. Bids Dec. 19. CD 1/10, under LB.

▲ **Joseph Salvucci & Sons,** 6601 Collowhill St., Phila., Pa. Separate Contracts. $3,000,000. 230 unit RESIDENTIAL DEVELOPMENT Aston Twp-Weir Rd., etc. CHESTER, PA., G. D. Houtman & Son, 112 W. Front St. Media, Pa., engrs.

▲ **B. Bornstein & Son,** 2027 Arch St., Phila. 3, Pa., CA $1,195,000 (14 bidders) general construction JUNIOR HIGH SCHOOL, Middletown Township School Dist., PARKLAND, PA. State School Bldg. Auth., 101 S. 25 St., Harrisburg, Pa. Bids Dec. 5. CD 12/13, under LB.

▲ **R. M. Shoemaker** 245 S. 24 St., Phila., Pa., CA $1,500,000. HOSPITAL addn., alterations, PHILA, PA. Chestnut Hill Hospital, 8835 Germantown Ave. Phila., Pa. Bids Nov. 26. CD 11/8.

▲ **Banks & Lee, Inc.,** Tower Bldg., Wash., D. C., LB $2,064,000. (9 bidders) HIGH SCHOOL, Oxon Hill, MARLBORO, MD. Prince George's Co. Bd. Educ., Marlboro, Md. Bids Jan. 14. CD 12/26.

SOUTH

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
January 29 Virginia
STREETS AND ROADS
January 29 Louisiana, Virginia

HEAVY CONSTRUCTION—LB & CA

▲† **Philco Corp. (Gov. & Ind. Div.)** 1900 W. Leigh Ave., Phila., Pa., CA Est. $2,000,000, communications system at Eglin Field Gulf Test Range with two 60 ft. parabolic antennas at Cape San Blass and Anclote Point, EGLIN AIR FORCE BASE, FLA. U. S. Eng., Air Material Area, Brookley Air Force Base, Mobile, Ala. CD 9/17.

▲† **Great Lakes Dredging & Dock Co.,** International Trade Mart Bldg., New Orleans, La., CA $1,707,411, Tarleton Bayou Big Bay Chene-Lake Chicot channel enlargement, St. Martin Parish, Inv. 58-81, LOUISIANA. U. S. Eng., foot of Prytania St., New Orleans, La. Bids Nov. 15. CD 11/22, under LB.

BUILDINGS—LB & CA

▲ **Mackle Co., Inc.,** 2818 S.W. 22nd St., Miami, Fla. CA Est. $1,750,000. 147 RESIDENCES, S.W. 111 Ave., S.W. 112 Ave., S.W. 55th St., S.W. 59th St., Westwood Lakes, MIAMI, FLA. Westwood Lakes, c/o General Contractor. James E. Vensel, 2820 Coral Way, Miami, Fla., archt.

▲ **Foster Wheeler Corp.,** 6200 Bowling Green, Houston, Tex., CA Est. $2,000,000, design and construct 10,000 bbl. daily capacity SULFURIC ACID ALKYLATION UNIT, BATON ROUGE, LA. Esso Standard Oil Co., North Baton Rouge, La. CD 10/9/51.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
January 29 Indiana — February 4 Michigan
STREETS AND ROADS
January 28 Indiana

BUILDINGS—BA

▲ **Wis., Racine**—Y.M.C.A. BLDG.—BA 1/31—Young Men's Christian Assn., Racine, Y.M.C.A. bldg. $2,000,000. Grassold, Johnson & Assocs., 734 N. Jefferson St., Milwaukee, Zone 2, archts. CD 11/20.

▲ **Wis., Hales Corners** — SCHOOL — BA 3/18 — Joint School Dist. 5, 6075 N. Cape Rd., high school. $1,250,000. Plans deposit $50. Schroeder & Spransy, 1750 W. Silver Spring Dr., Milwaukee, archts. Boswell & Villa, 1414 N. 12 St., Milwaukee, archts.-engrs. CD 7/12.

▲ **Mich., Grand Rapids**—WAREHOUSE, etc.—BA 2/7—Spartan Stores, Inc., 1501 Buchanan, Grand Rapids, warehouse-administration bldg., 44th St. and Fuller St. S.W. $2,000,000. Plans deposit $15. J. & G. Daverman Co., 924 Grandville St., Mich., archt. CD 1/3.

BUILDINGS—LB & CA

▲ **Brown Constr. Co.,** 2520 Payne Ave., Cleveland 14, O., CA Est. **$2,250,000,** general contract HOSPITAL addn. PAINESVILLE, O. Lake County Memorial Hospital, Painesville, O. Bids Dec. 4. CD 10/1.

▲ **Fred Ziegler,** 1043 Mentor Ave., Painesville, O., CA **$2,600,000,** 200 ranch-type HOMES, Rte. 86, in Leroy Township, as Sunshine Acres No. 2, PAINESVILLE, O. Weyls Realty Co., 1043 Mentor Ave., Painesville, O.

▲ **Cosmopolitan Housing Corp.,** 3896 Mahoning St., Youngstown, O., Owner Builds. **$3,000,000,** 146 one story HOUSING, Herron Heights, Lockwood Blvd., YOUNGSTOWN, O.

▲ **Darin & Armstrong, Inc.,** 2041 Fenkel St., Detroit, Mich., CA Est. **$2,500,000,** ASSEMBLY, TESTING AND SHIPPING FACILITIES, Plymouth Rd. and West Outer Dr., REDFORD, (STA. DETROIT), MICH. General Motors, Detroit Diesel Div., 13400 W. Outer Dr., Detroit, Mich. Argonaut Realty Div., Argonaut Bldg., Detroit, Mich., engrs.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

January 30 Kansas — January 31 Minnesota

STREETS AND ROADS

January 30 Kansas — January 31 Minnesota

▲ **Minn., St. Paul**—BA 1/28—City, O. P. Simon, Jr., purch. agt., 253 City Hall, contract No. 2, furnish, construct about 41,739 lin. ft. 60 in. water conduit, etc. from Mississippi River Station to Pleasant Lake. $2,750,000. CD 5/5.

▲ **Oklahoma**—PRODUCTS LINE—Bids Asked—Cherokee Pipe Line Co., (subsidiary of Cities Service Co. & Continental Oil Co.), Ponca City, 78 mi. 12 in. products line from Ponca City Refineries to Tulsa, Kay-Tulsa Counties $1,560,000.

HEAVY CONSTRUCTION—LB & CA

▲ **Interstate Constr. Co.,** 3621 Troost, Kansas City, Mo., LB **$1,334,931,** est. $1,395,720, 2 floors, 60,690 sq. ft. 142 x 485 ft. Municipal Air Terminal, Passenger Office and Operations Bldg., new concourse to proposed restaurant, parking, etc., KANSAS CITY, MO. City, c/o Ronald White, City Aviation Comn., City Hall, Kansas City, Mo. Bids Jan. 10. CD 12/19.

▲† **Brown-Boveri Corp.,** 19 Rector St., New York, N. Y. LB **$9,502,330.** (6 bidders), design, manufacture, delivery and installing seven 89,474 KVA hydraulic turbine generators at Oahe Dam Site near Pierre, CIVENG-25-066-58-60, SOUTH DAKOTA. U. S. Eng., 1609 Jackson St., Omaha, Neb. Bids Jan. 7. CD 11/20.

BUILDINGS—LB & CA

▲ **Naugle-Leck Inc.,** Baker Bldg., Minneapolis, Minn., CA Est. **$14,000,000-$18,000,000,** constr. 28 story, BANK-OFFICE BLDG., Second Ave. South between Fifth and Sixth Sts., MINNEAPOLIS, MINN. First National Bank, Fifth St. and Marquette Ave., Minneapolis, Minn. Bids Nov. 6. CD 10/9.

▲ **University of Arkansas,** T. C. Carlson, secy.-treas., Fayetteville, Ark., rejected bids Dec. 18, 4 story, bsmnt., WOMENS DORMITORY wing and 1 story LOUNGE and DINING ROOM, FAYETTEVILLE, ARK. LB **$1,585,180.** CD 12/27, under LB.

▲ **Edinburg Community Hotel Corp.,** c/o Joe Davis., pres., Edinburg, Tex., rejected bids Oct. 29, Luxury HOTEL-MOTEL, EDINBURG, TEX. New bids about Jan. 15. CD 11/7, under LB.

▲ **Gerald H. Phipps, Inc.,** Box 2068, Denver, Colo., CA Est. **$3,500,000,** 1 story, part bsmnt. SUPERMARKET and 1 story part bsmnt. RESTAURANT, part of shopping center, (32 stores) S. Zuni St. and W. Alameda Ave., DENVER, COLO. Alameda Shopping Center, Inc., 2000 W. 8th Ave., Denver, Colo. Awarded Jan. 7. CD 7/26/54.

▲ **Robert E. McKee Gen. Contr., Inc.,** Box 1706, Santa Fe, N. M., CA Est. **$3,000,000,** electric POWER PLANT, Algodones, 26 mi. north of Albuquerque on U. S. Hy. 85, NEW MEXICO. Plains Electric Co-operative, 915 Copper Ave. N. E. Albuquerque, N. M. REA financed CD 5/16/56.

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

STREETS AND ROADS

January 30 Nevada — February 5, 6, 19 California

BUILDINGS—BA

▲ **Calif., Los Angeles**—RESIDENCE HALL—BA 2/4—University of California, 404 Hilgard St., 10 story

(Continued on page 105)

From here on, *all you need is a wrench*

Seattle, Washington, **engineered this 8585-ft. addition to its growing network of Dresser-Coupled steel water lines. All joints on the 40-ft. lengths of 48-inch pipe were Dresser-Coupled. The line was laid by Harbor Construction Company.**

The fast way is the Dresser way

No unforeseen delays, no unforeseen costs when you join water pipe the Dresser way. Non-rigid Dresser Couplings go on fast . . . without expensive equipment or specialized labor. All you need is a wrench . . . and with long lengths of steel pipe, you need fewer joints. Bottle-tight joints make it unnecessary to allow for leakage. Figure your next water line with Dresser Couplings . . . you can calculate your costs accurately . . . and *lower!*

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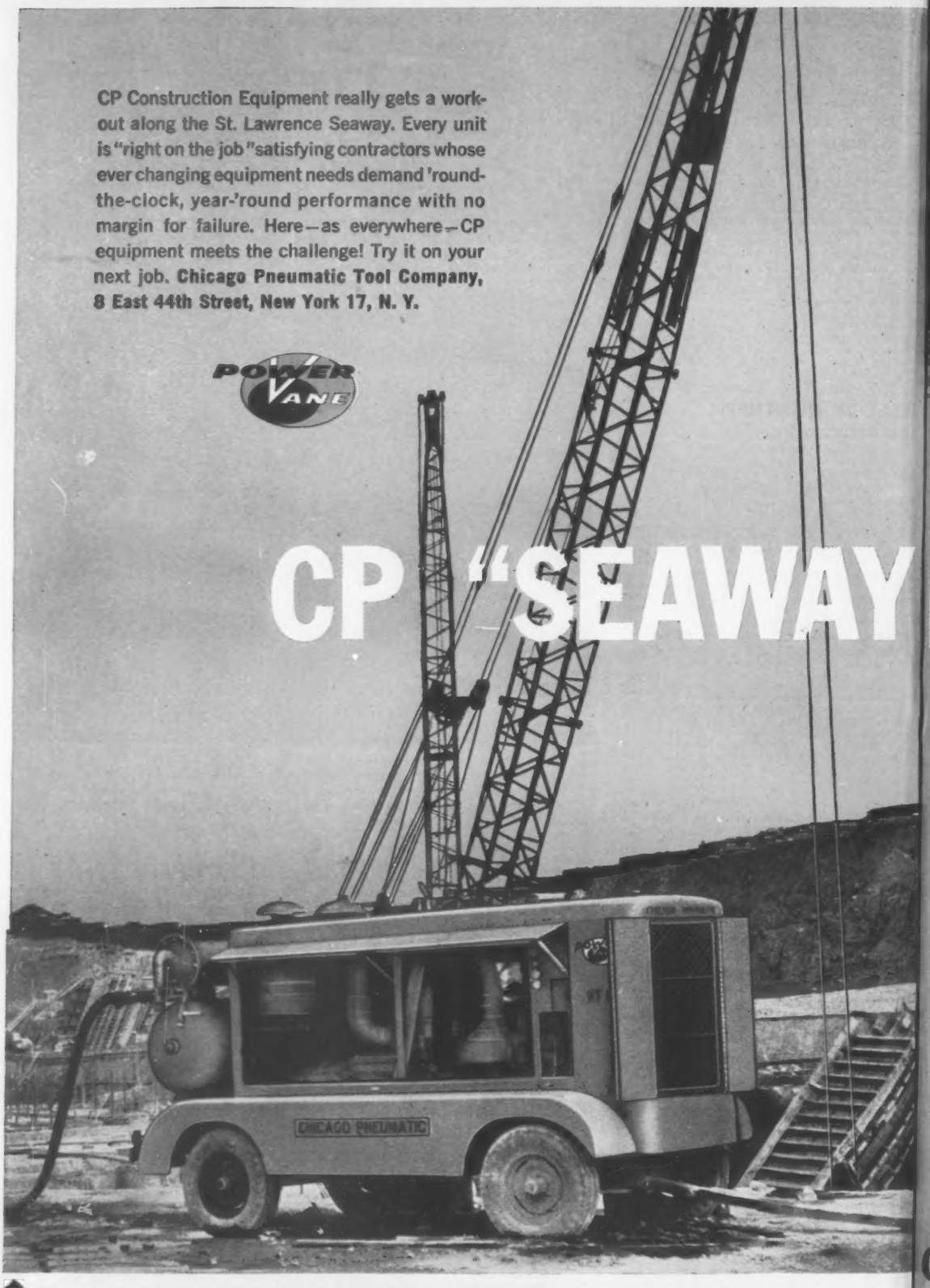
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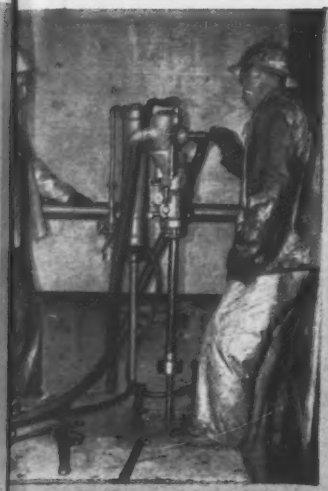

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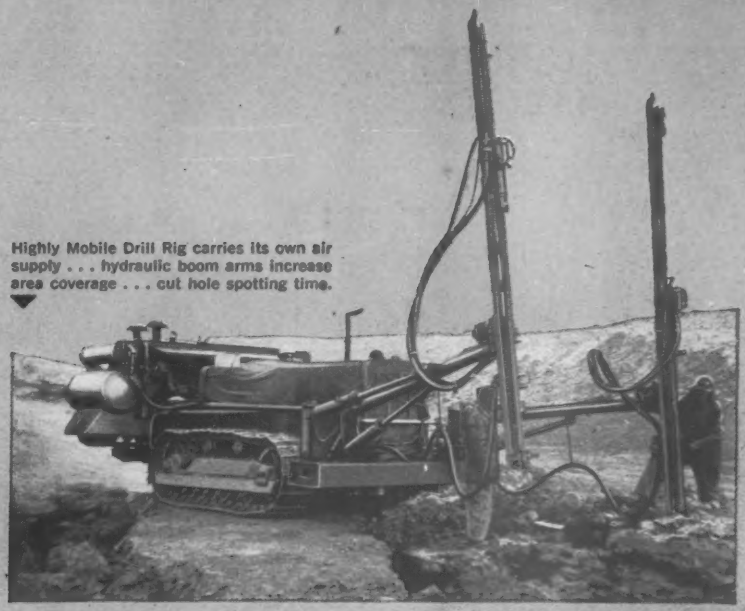

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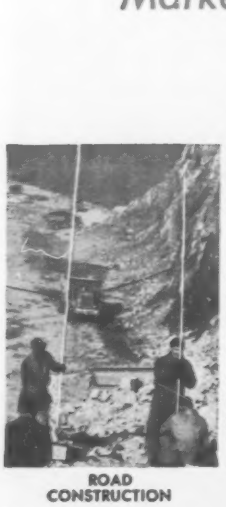
ROAD CONSTRUCTION

QUARRYING

METAL MINING

COAL

OIL EXPLORATIONS

(Continued from page 101)

reinforced brick, concrete Clarence Dyskstra Residence Hall, UCLA Campus. $2,500,000. Plans deposit $300. Welton Becket & Assoc., 5657 Wilshire Blvd., archts. CD 3/28, under LB.

▲† **Wash., Spokane**—HOUSING—BA 2/11—Base Procurement Office, Fairchild Air Force Base, constr. 250 unit housing. $5,000,000. Plans deposit $100. CD 1/22.

▲ **Calif., Hayward**—SCHOOL—BA 2/19—Hayward Union High School Dist., c/o Supt., 22300 Foothill Blvd., Cherryland High School. $1,790,750. Plans deposit $100. Anderson, Simonds, Dusel & Campini, 2800 Park Blvd., Oakland, archts. CD 8/22/56.

HEAVY CONSTRUCTION—LB & CA

▲ **WASHINGTON**—State Hy. Comn., E. A. Cowell, chn., Olympia,
Fiorito Brothers, 1100 Leary Way, Seattle, Wash., CA $1,732,683, paving 6.252 mi. Primary State Hy. No. 1, FAP No. I-001-2(55), Thurston Co. Bids Jan. 7, awarded Jan. 9. CD 1/10.

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles,
Webb & White, 512 S. San Vicente Blvd., Los Angeles, Calif., LB $1,484,677 (14 bidders) major grade separation and traffic interchange incl. 2 bridges to carry traffic over Harbor Freeway and underpass under Harbor Freeway at intersection of Santa Monica Freeway and 2 detours about 0.8 mi. Los Angeles Co. Bids Jan. 9. CD 12/13.

▲ **Noyes—Roach Co.,** 5017 Telegraph Rd., Los Angeles, Calif., LB $1,467,500 (9 bidders) rein.-con. stadium, COMPTON, CALIF. Compton Junior College District, Compton, Calif.

▲ **J. E. Young Pipe Line Contractor, Inc., & H. W. Anderson,** 931 E. Rosecrans Ave., Los Angeles, Calif., CA $1,663,387, Sch. I; CA $2,708,677 Sch. IIB; CA $1,993,789, Sch. IIIA, Spec. 201, constr. second San Diego Aqueduct to bring water from Colorado River with steel pipe concrete coated and lined, SAN DIEGO, CALIF. San Digo County Watr Auth., Land Title Bldg., San Diego, Calif. Grand total $6,365,853. Bids Nov. 18. CD 11/22, under LB.
Charles L. Harney, Inc., 575 Berry St., San Francisco, Calif., LB $1,428,958 (4 bidders) track removal and paving reconstr. portion of Geary Blvd., Spec. 21,593, SAN FRANCISCO, CALIF. City and San Francisco Co., City Hall, San Francisco, Calif. CD 11/13.

BUILDINGS—LB & CA

▲ **Ross B. Hammond,** 1241 N. Williams Ave., Portland, Ore., LB $1,989,000, 6 story HOSPITAL, PORTLAND, ORE. Kaiser Foundation, 2606 N. E. Broadway, Portland, Ore. Bids Jan. 10. CD 12/10.

▲ **James I. Barnes Constr. Co.,** 1119 Montana Ave., Santa Monica, Calif., CA $3,137,180, general contract 5 story bsmt., 201,000 sq. ft. total area of 4 OFFICE floors addition, 2 parking floors, Div. of Highways, Distr. VII office bldg., LOS ANGELES, CALIF. State Div. Architecture, 1100 S. Grand Ave., Los Angeles, Calif. Grand total $4,462,180. Bids Jan. 8. CD 1/13, under LB.
State Plumbing & Heating Co., 49249 Exposition Blvd., Los Angeles, Calif., CA $595,000, air conditioning, heating and refrigeration work, for Div. Hys. Dist. VII office bldg. addn. (Los Angeles, Calif.).
A. S. Schulman Electric Co., 641 Imperial St., Los Angeles, Calif., CA $730,000. electrical work for Div. Hys. District VII office bldg. addn. (Los Angeles, Calif.).

▲ **The Gallegos Corp.,** 2120 S. Main St., Santa Ana, Calif., LB $1,790,000. (12 bidders) 4 story, rein.-con. HOSPITAL addn., NEWPORT BEACH, CALIF. Hoag Memorial Hospital, 301 Newport Blvd., Newport Beach, Calif. Bids Jan. 8. CD 12/10.

CANADA

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
January 29 Ontario
STREETS AND ROADS
January 29, February 12 Ontario

▲ **Que., Montreal**—BA 2/12—City, City Hall, constr. 50 m.g. Rosemount Reservoir, bounded by Beaubien, Bellechase, 16th and 18th Aves. $3,250,000. CD 1/6/58.

BUILDINGS—LB & CA

▲ **Roslyn Realties Ltd.,** St. John's, Newfoundland. Owner Builds. $1,500,000, APARTMENT PROJECT, 3 story, 10 buildings, 120 apartments, Elizabeth Ave., ST. JOHN'S, NEWFOUNDLAND. CD 1/2.

▲ **Dalton Engineering & Constr. Co. Ltd.,** 1140 Castlefield Ave., Toronto, Ont., CA $1,400,000 (6 bidders) 5 story, 98x114 ft., exterior aluminum, glass and masonry constr. OFFICE BLDG. with 3 underground parking levels and 38,000 sq. ft. rentable office space, University Ave. and Dundas St. W., TORONTO, ONT. New York Life Insurance Co., 320 Bay St., Toronto, Ont. Bids Nov. 22. CD 11/8.

LATIN AMERICA

HEAVY CONSTRUCTION—BA

▲ **Argentina**—BA 2/10—Ministerio de Obras Publicas Avenida 9 de Julio No. 1925, Buenos Aires, study, planning, constr., financing tunnel under Parana River to join cities of Santa Fe and Parana. Extended date. CD 10/10.

(Proposal Advertisement see pp. 118 to 121)

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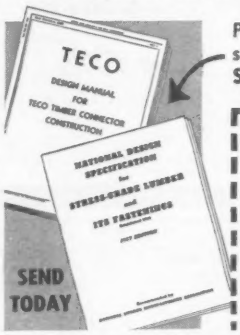
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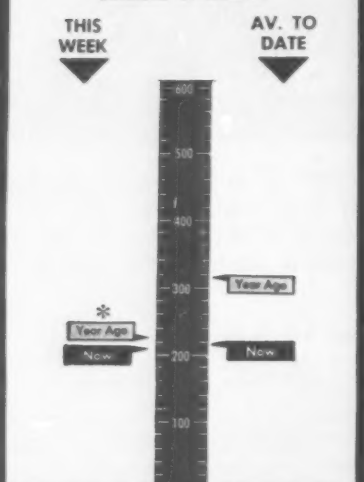
Milwaukee—Twin Cities—Denver—New Orleans

Construction Scoreboard

ACTIVITY THIS WEEK

Contract Awards
Millions of Dollars

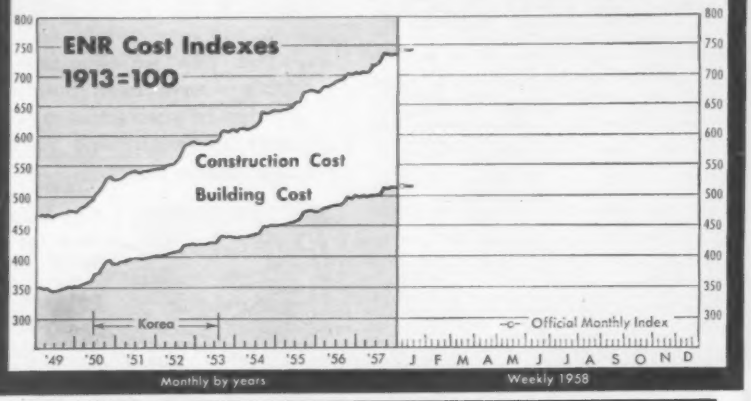


*4-day-week

COST INDEXES AS OF NOW

ENR INDEXES (1913=100), 20-cities' average	Week of Jan. 16 1958	% Change from Dec. 12 1957	% Change from Jan. 17 1957
Construction Cost	743.51	+0.01	+4.9
Building Cost	516.26	−0.03	+2.7

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.000; Building Cost by 1.850
1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518



AMOUNT OF CONTRACTS LET

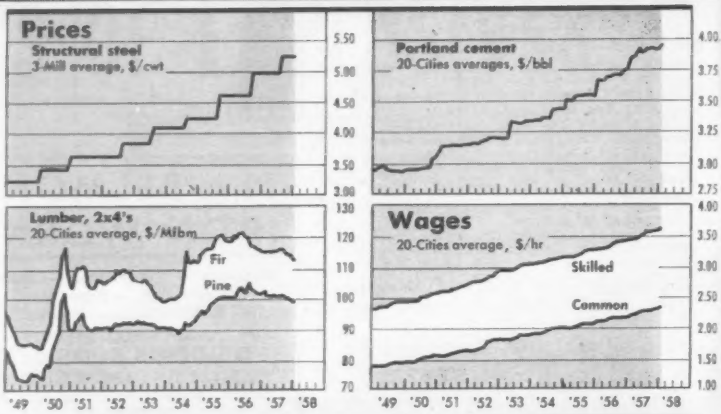
By Ownership	This Week	Cum. 4 wks 1958	Chge '57-'58
	millions		%
All Heavy Constr.	$218.9	$869.0	−31
Private	93.3	381.2	−26
Public	125.6	487.8	−34
State & Municipal	97.5	395.4	−23
Federal	28.1	92.4	−59
By Type of Work			
Public			
Waterworks	9.0	22.1	+101
Sewerage	5.8	48.2	+10
Bridges*	5.4	14.7	−65
Highways	28.7	146.8	−29
Earthwork, Waterways	8.2	20.1	−83
Buildings, Excl. Housing	37.6	142.9	−16
Housing	20.3	55.1	+4
Unclassified	10.5	37.8	−61
Private			
Mass Housing	38.2	138.3	−35
Commercial	36.5	93.1	+55
Industrial	15.5	112.6	−49
Unclassified	3.2	37.3	+42

* Includes private bridges.

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

NEW CAPITAL FOR CONSTRUCTION

	Week of Jan. 16	Cum. 3 wks 1958	Chge '57-'58
	millions		%
Corporate Securities	$75.9	$111.0	−74
State and Municipal:			
All Except Housing	79.7	375.9	+176
Housing	0.6	0.7	...
Federal Loans	16.1	21.1	+145
Federal Aid	...	....	...
Total Nonfederal	$172.8	$508.7	−11
Federal Appropriations:			
Projects in U. S.	...	....	...
Outside U. S.	...	....	...
Total New Capital	$172.8	$508.7	−11



ENR COST INDEXES IN 22 CITIES, 1913 = 100

City	Construction Cost Jan. 1958	Construction Cost Percent Change from last Month	Construction Cost Percent Change from last Year	Building Cost Jan. 1958	Building Cost Percent Change from last Month	Building Cost Percent Change from last Year
Atlanta	548	0	+4.8	456	0	+3.1
Baltimore	670	0	+4.4	520	0	+4.4
Birmingham	593	+0.2	+7.1	477	+0.2	+4.6
Boston	765	0	+2.2	523	0	+2.3
Chicago	836	−0.02	+5.8	528	−0.04	+4.3
Cincinnati	748	0	+5.2	504	0	+3.6
Cleveland	853	−0.6	+4.0	519	−1.0	+2.0
Dallas	547	0	+2.5	451	0	+0.8
Denver	710	0	+2.0	522	0	−0.1
Detroit	851	+2.4	+5.2	545	0	+3.2
Kansas City	742	0	+3.9	517	+0.2	+2.8
Los Angeles	778	0	+6.4	513	0	+3.9
Minneapolis	788	0	+4.0	537	0	+2.0
New Orleans	588	−0.5	+4.2	478	−0.6	+3.0
New York	909	+2.4	+6.9	593	+0.3	+2.8
Philadelphia	775	0	+3.5	561	0	+0.9
Pittsburgh	804	+2.0	+9.4	569	+0.2	+5.2
St. Louis	814	+2.1	+7.0	551	+1.0	+4.2
San Francisco	762	+0.1	+5.3	507	+0.2	+3.9
Seattle	785	+5.1	+6.1	466	+1.7	+3.5
U.S.—20 Cities' average	743	+0.7	+5.0	517	+0.1	+3.0
Montreal	584	−1.2	+4.1	446	−1.3	+1.8
Toronto	609	0	+1.2	471	0	+0.7

Defense Building Gets Priority

Congress moves swiftly to provide defense funds; money to be available for construction this year

Congress is moving fast to make money available to the armed services for the construction that will be needed quickly to make effective the nation's drive to get ahead of the Soviets in guided missiles and space projects.

The House last week approved a $550 million emergency authorization bill to back up the Administration's plans for building missile bases in the U.S.—including the first bases for ICBMs—and the money necessary to disperse Strategic Air Command bomber bases.

Money to back up the authorization bill is contained in the $1.3 billion supplemental appropriation bill that President Eisenhower submitted to Congress—money that will be available for contract awards this year, if the military can commit the money that fast.

The speed with which the House acted demonstrates the mood of Congress to vote funds for defense projects—arguing only over whether the Administration's requests are big enough.

There was not a single vote against the bill in the House.

The authorization bill the House passed includes items with real construction money:

$194 million for dispersing SAC bases;

$112 million authorization for the third ICBM base in the U.S., for which a site has not yet been selected. The first ICBM launching site will be in Wyoming, and a training base has been designated in California;

$189 million for a ballistic missile detection system part of which will be for construction of facilities (as the DEW line, for instance); and

$29.6 million for SAGE (semi-automatic ground environment)—the continent-wide radar-fighter control hookup designed to enable us to launch counter-attacking plans as soon as enemy vehicles are spotted.

The SAC base program is the big one, of course. The dispersed bases will call for construction of runways, aprons, parking areas, housing and some buildings to take care of maintenance and fueling needs of the 14 or 15 aircraft that are expected to be stationed at each of the bases.

Here's a rundown of how the Air Force expects to spend its money on 25 of these bases:

Ellsworth Air Force Base, S. D., $3,194,000.

Fairchild Air Force Base, Spokane, Wash., $1,461,000.

Grand Forks Air Force Base, N. D., $895,000.

Griffiss Air Force Base, N. Y., $664,000.

Larson Air Force Base, Washington, $2,603,000.

Lockbourne Air Force Base, Ohio, $1,089,000.

Loring Air Force Base, Maine, $1,524,000.

Malmstrom Air Force Base, Montana, $872,000.

Minot Air Force Base, North Dakota, $867,000.

Mountain Home Air Force Base, Idaho, $4,380,000.

Offutt Air Force Base, Nebraska, $690,000.

Pease Air Force Base, New Hampshire, $1,668,000.

Plattsburg Air Force Base, New York, $1,116,000.

Westover Air Force Base, Massachusetts, $2,368,000.

Eglin Air Force Base, Florida, $8,958,000.

Glasgow Air Force Base, Montana, $29,644,000.

Kinross Air Force Base, Michigan, $23,762,000.

K. I. Sawyer Airport, Michigan, $27,233,000.

Robins Air Force Base, Georgia, $3,667,000.

Wright-Patterson Air Force Base, Ohio, $22,632,000.

Wurtsmith Air Force Base, Michigan, $22,349,000.

Clinton County Air Force Base, Ohio, $8,776,000.

Dover Air Force Base, Delaware, $4,715,000.

Ernest Harmon Air Force Base, Newfoundland, $2,217,000.

Selfridge Air Force Base, Michigan, $17,487,000.

Big Project Ahead

Developers named for St. Louis renewal job

Development of the 465 acre Mill Creek Valley area, St. Louis' $200 to $250 million federal aid urban renewal project, has been awarded to a combination of City and Suburban Homes Co., New York City, and a group of St. Louis businessmen.

Construction is scheduled to start early next year, and the developers expect work to extend over a 10-year period. Mill Creek Redevelopment Corp. will be organized to coordinate the work of the two groups. Later, subsidiary companies will be formed to handle segments of the project.

City and Suburban Homes Co. will execute two-thirds to three-quarters of the residential work. The local group will be responsible for the remaining residential construction, most of the commercial and all of the industrial construction.

Of the 465 acres, 75 will be for residential, 165 industrial and 25 commercial. The remaining land will be used for parks, walks and roads. Three types of residential structures will be built; 525 units of elevator buildings, 525 units of three-story walkup apartments and 1,050 units of two-story houses. Rentals in the highrise-buildings will run to a maximum of $40 a room and $25 to $30 a room in the low buildings. The individual houses will be priced between $12,000 and $17,000.

The group has offered 35¢ to 50¢ a sq ft for the residential land, $1 to $1.50 a sq ft for industrial land, and $1.50 to $3.00 a sq ft for commercial parcels. However, final prices will be determined by negotiation.

James H. Scheuer, chairman of City and Suburban Homes' executives committee, announced that financing of the residential building will be through either Federal Housing Authority insured mortgages obtained from private lending institutions or a loan from the Federal National Mortgage Association (Fannie Mae).

Clarence M. Turley, a spokesman for the St. Louis group, said industrial construction will be financed by loans from private institutions.

Portland Cement Sales Show Decline in Alabama

Sales of portland cement are in a slump in Alabama, the largest cement-producing state in the Southeast. The decline was attributed to poor construction weather and last summer's strike by cement workers. The strike led to heavy imports of cement, which are now being used by contractors at the expense of domestic cement company sales. One executive estimated that 2 million bbl were imported during the July strike.

(Continued on page 108)

R. H. Bond, sales manager at Universal Atlas Cement Co., Birmingham, said that unless his company can make "some pretty large shipments, we may have to close down, too." He was referring to the shutdown of the Demopolis plant of Lone Star Cement Corp.

However, Mr. Bond was optimistic about this year's business, saying that sales will rise shortly "if we get some breaks in the weather." Universal Atlas operates one plant at Leeds, Ala., employing about 300 persons.

Sam B. Preston, vice president of National Cement Co., said production may be curtailed this month unless sales start to climb.

Another firm reporting poor sales was southern Cement Co. W. J. Cabaniss, president, said poor weather conditions were responsible.

Alcoa Halts Expansion As Slump Hits Aluminum

The current business decline has prompted the Aluminum Company of America to halt work on three projects in its over-$100 million expansion program.

The largest facility hit by the stop-work order is the $80 million smelter plant under construction at Yankeetown, Ind., near Evansville. Also held up is work at Point Comfort, Tex., where Alcoa is building a new refinery and expanding the capacity of a smelter.

Explaining that "existing high inventories of aluminum, coupled with decreased demand" were responsible for the move, Alcoa added that some construction workers will remain to complete work on which it is not feasible to stop immediately.

Steel Price Hike of $7 A Ton Predicted for July

A mid-year price boost for steel of at least $7 a ton was predicted last week by Avery C. Adams, president of Jones & Laughlin Steel Corp. Mr. Adams made the forecast at a meeting of the Pittsburgh Society of Financial Analysts.

He also said that there would be an increase in the steel industry's operating rate during each successive quarter of the year, but he added that the operating rate would not have any effect in establishing the amount of the price increase.

Mr. Adams said that it is the "impact of costs" that must be considered and he noted that steel prices were raised in 1954 when there was a drop in the rate of ingot production.

The last price increase occurred in July 1957, after an increase in labor costs that steel producers estimated totaled 20 cents an hour. The boost then was $6 a ton, or approximately 4%. Wages of steel workers moved up this month under cost-of-living provisions in labor contracts, but no price changes have been made by the steel firms.

Money In the Till

Missouri sells building bonds of $55 million

The recent turn in the bond market played into the state of Missouri's hands last week as $55 million in building bonds were sold at an interest rate well below earlier expectations. This final block of a $75 million authorization for construction of mental, penal and educational facilities went to a Harris Trust & Savings Bank combination at 2.3% interest and just a shade over par value.

Missouri's bond troubles made financial headlines last fall (ENR Oct. 3, 1957, p. 104) when a $30 million block from the same authorization was offered for sale but received no bids. The reason was a state constitutional amendment fixing the maximum interest rate at 3%, coupled with a law stipulating that bidders buy at par value or better. These terms were out of line with the rates prevailing last fall and a special legislative session was called to remove the par value restriction. The legislators couldn't touch the constitution-anchored interest rate ceiling.

By clearing the way for offers to buy bonds below par, Missouri accommodated itself to the existing market. Bond buyers would get a higher yield and the state's cost of borrowing would rise.

But when the state moved again to sell, the market had passed its peak and was headed downward. The new offering sold comfortably below the anticipated interest cost and a fraction of a cent above par. The legislators' extra work proved unnecessary, but the delay saved a considerable sum.

State Will Double Its 1958 Public Works Volume

Work will begin on over $170 million in state building projects during 1958, the California Division of Architecture has announced. The building program will be more than double the $82 million that went to construction in 1957. About $70 million will go to state agencies in northern California and $99 million to agencies in southern California.

The work in 1958 will include, for the first time in the state's history, residence halls at state colleges, for which $30 million has been allotted.

State Architest Anson Boyd said the new year's work would include over 374 general contracts and require more than 3.9 million man days of labor by the construction trades, 57,100 tons of reinforcing and structural steel, 376,000 cu yd of concrete, 1 million bbl of cement, and 1.2 million tons of sand and gravel.

Major projects to be undertaken are a $10.5 million office building in Los Angeles; a $4.5 million office building in Oakland; a $3 million office in Fresno; a $3.3 million home office for the State Compensation Insurance Fund in San Francisco; a $13.5 million medium security prison at Los Padres; a $6.5 million training school at Chino for the Department of Youth; a $5 million addition to the State Division of Highways office building in Los Angeles, and a $4.6 million science building for the San Fernando Valley campus of the Los Angeles State College of Applied Arts and Sciences.

Green Fields

Two U.S. firms bid for German A-power business

Two U.S. firms have moved to obtain a foothold in the fast-developing West German atomic energy market. The companies, North American Aviation, Inc., and Westinghouse Electric Corp., have signed agreements with German firms in anticipation of rapid growth in this newest German industry.

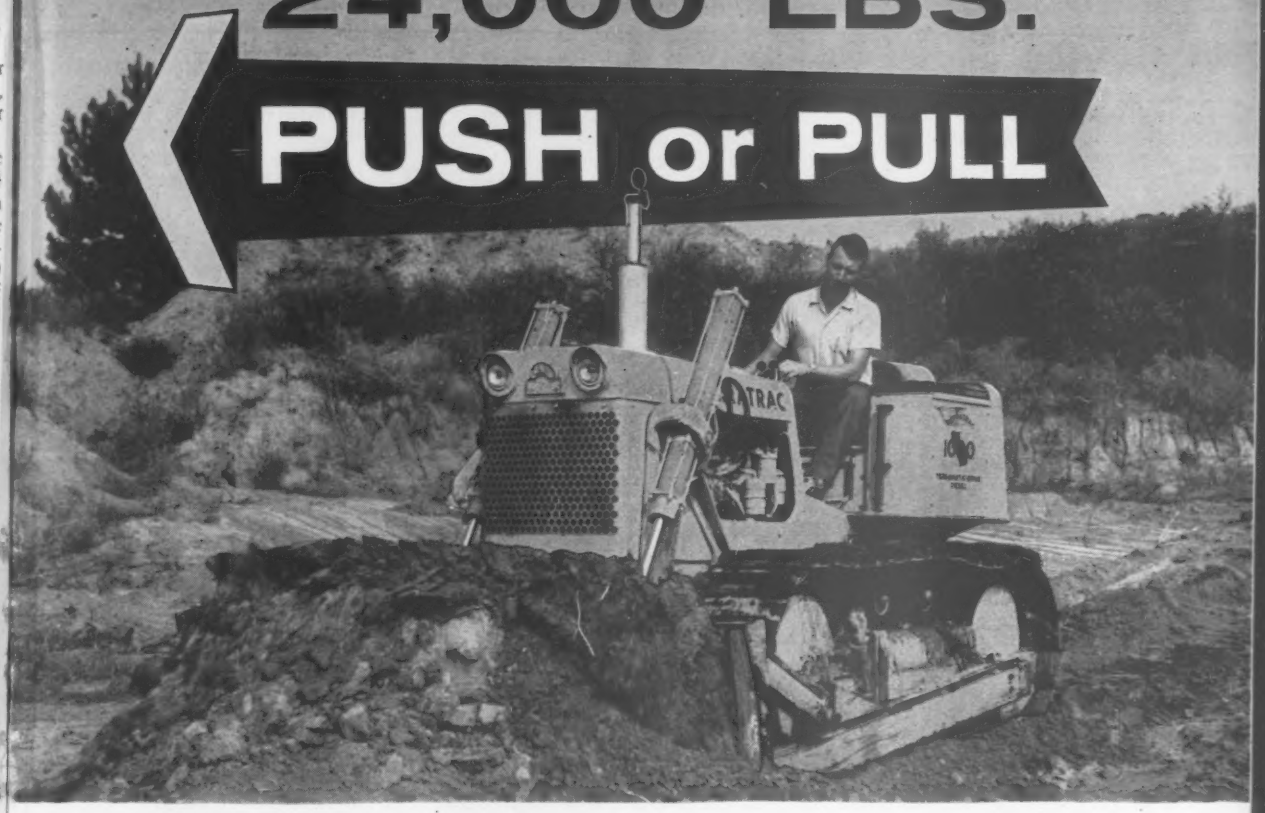
North American, through its Atomics International Division, has formed Interatom Internationale Atomreaktobau in partnership with Demag AG, a Duisburg firm. The subsidiary ultimately will design and manufacture atomic reactors and related products. In the early stages, Interatom will act as project manager and subcontractor for reactors designed by North American.

Demag AG designs and manufactures heavy equipment and machinery. Engineering and construction of chemical and steel plants are also among its activities.

The second grouping involves Westinghouse's subsidiary, Westinghouse Electric International Co., and the Siemens organization of West Germany. The two firms signed a technical assistance agreement covering construction and sale of full-scale atomic power plants of Westinghouse design.

When signing the pact, E. V. Huggins, a Westinghouse vice president,

24,000 LBS. PUSH or PULL



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said it would "enable Germany to make a major advance in design and production knowledge." West Germany was permitted to begin non-military exploitation of atomic energy only last year. The agreement will give Siemens access to details, design and manufacturing data for reactors and related parts.

Euratom, the all-Europe atomic energy commission, has set ambitious goals for atomic power development by member nations. "As one of the six Euratom countries," Mr. Huggins continued, "West Germany will undoubtedly play an important role in the development of atomic power on the continent."

Westinghouse has similar agreements with firms in Belgium and France.

Construction Markets

Toledo, Ohio: An On-the-Spot Report

"Spotty" is a good description of the construction market in Toledo. Municipal and governmental spending is down. And residential construction suffered sharp setbacks in 1957, but industrial work held firm.

"It does not look too encouraging. Perhaps the situation has stabilized, for it is not going down. Maybe construction will pick up in the summer, in the area as well as Toledo," is the way a paving contractor summed up the construction picture. A concrete pipe firm executive said, "things look fair, but I still find that I'm worried."

The volume of highway work is down now that the Ohio turnpike and Toledo-Detroit expressway are under contract, and contractors are frankly annoyed by the small amount of highway money coming into the area. The only job programmed is a short relocation of U.S. 23 west of Toledo in Sylvania Village, at a cost of $1.5 million.

There also is grumbling over the large amount money and effort the state highway department is pouring into the Conneaut-Cleveland-Columbus-Cincinnati freeway. The feeling of engineers in the area was expressed by B. R. MacRitchie, former Toledo service director and now with a private contractor: "If the route can't be justified economically as a turnpike, why pour our good tax dollars into it?"

Residential construction is still hedged with "ifs" and "buts."

Otto Holtgrieve, assistant treasurer of the Toledo Trust Co., assessed the situation in this way:

"Assuming the general economy will be more stable this year and that the unemployment situation improves, new commercial construction should increase in the spring. If demand for funds for capital improvement declines, there should be more for residential building in 1958."

While acknowledging a slight easing of money, another banker wondered whether the benefits of this would be offset by a rise in unemployment. He believes that building starts in 1958 will be on a par with 1957, but warned: "Builders are optimistic. But they always are and perhaps should be."

Residential starts in Lucas County (which includes Toledo) were 6,647 in 1957 through November, according to Chamber of Commerce figures. When the cost of labor, equipment and other items is added, the $49.3 million these starts represent reaches total expenditure of $100 million, the chamber estimates. If the banker's forecast proves accurate, this could indicate the value of the 1958 residential market.

Industrial construction showed greater activity than residential in 1957, and most people hope this trend will continue. Right now, however, most of this activity seems to revolve around the preparation of land. Gulf Oil Corp., for instance, is busy dismantling obsolete units at its Toledo refinery but has not awarded contracts for new construction. Bids have been taken but no details disclosed.

The Toledo Port Authority also expects to prepare land at two cites. One is at Presque Isle at the mouth of the Maumee River where construction of warehouses and shipping berths is planned. The other site is at the "Middlegrounds" on the west bank of the river within Toledo. Here construction of grain elevators has been proposed.

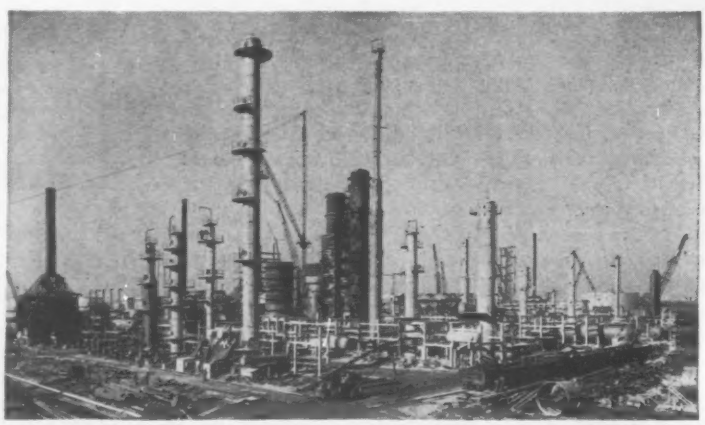
In municipal work, 56 projects are listed in the 1958 city budget.

There will be 24 streets and 27 alleys paved and five storm sewers built at an estimated cost of $204,000. A planned extension of the waterworks system has been held in abeyance until annexation squabbles between the city and surrounding townships have been settled.

Urban renewal has been under study since 1951. Now a $2.6 million project has been developed and final plans must be submitted to the Public Housing Administration this month.

School building, fortified by the approval of numerous bond proposals in last November's elections, will pick up later this year. At the moment many projects are not yet on the drafting boards.

Drawings are completed for a $3 million storm sewer the county will construct this spring. Beyond this no large projects are planned by the county, though $1 million will be spent on maintenance.



OIL REFINERY for Standard Oil of Ohio was a big item in Toledo's 1957 construction market. It is expected a similar facility for Gulf Oil Co. will start this year.

Lifting heavy beams for steel-skeletoned skyscrapers, over the heads of pedestrian and vehicular traffic, calls for careful loading — with safe slings, stout wire rope and a crane that's securely guyed with steel cables. Structural steelworkers practice safety because they know that . .

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With its basically simple 2-cycle design (power at *every* piston downstroke), there's more power in less space and weight—more work with less piston travel—less loss of power at high altitude. And lower-cost interchangeable parts reduce inventory requirements—*insure lower costs over the entire life of the engine.*

Leading highway haulers who have had the opportunity to benefit from this new "71E" engine report outstanding fuel mileage and reduced upkeep compared with other Diesels they operate and major savings over gasoline engines they have replaced.

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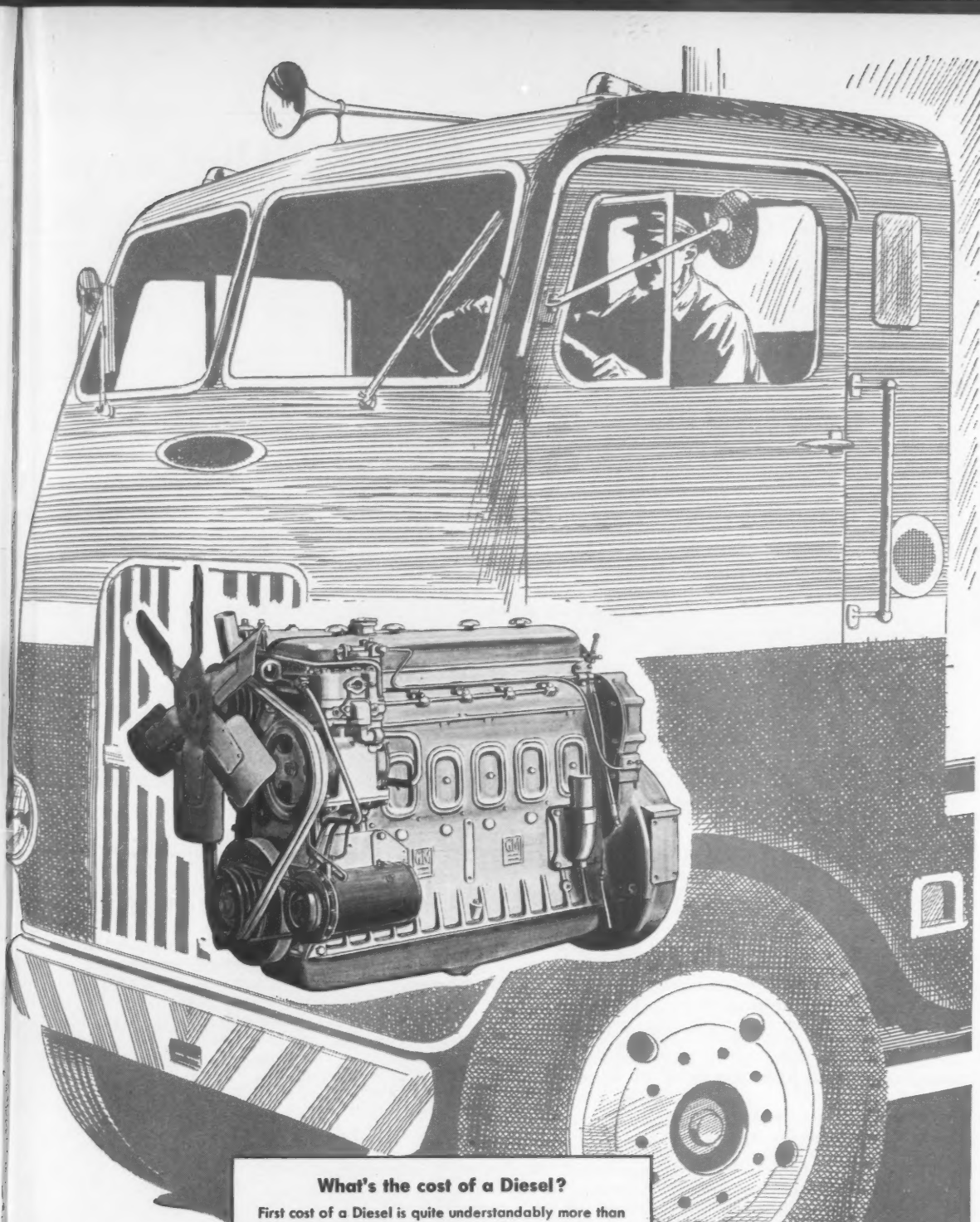

What's the cost of a Diesel?

First cost of a Diesel is quite understandably more than a gasoline engine because the Diesel's fuel-saving high compression requires greater precision and ruggedness. But the Diesel more than pays for itself in timesavings, fuel economy and reduced maintenance. Due to simpler 2-cycle design and lower-cost interchangeable parts, *a GM Diesel gives you lowest costs over the entire life of the engine—it's the thriftiest Diesel ever built!*

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Prevailing Wages for Federal Highways

A legislative provision that many questioned has seen nearly a year and a half of successful administration

Administration of the prevailing wage provision of the Federal-Aid Highway Act of 1956 has neither hamstrung nor delayed the federal highway program. Contrary to the initial fears of many, it has been decidedly successful.

The provision—which calls for the payment of minimum wages not less than those prevailing for the same type of work on "similar construction" in the "immediate locality"—has been in effect for 17 months. Here's the record achieved as reported to ENR:

• From the inception of the program in July, 1956, to January 3, 1958, 2,614 wage determinations were issued by the U. S. Department of Labor. Number challenged has been nominal. Wage determinations have been issued expeditiously and advertisements for bids have not been delayed because of this requirement.

• Through the use of the department's regional offices, most of the preliminary work has been decentralized. Participation by interested parties at the local level has been encouraged and promoted. New forms and new rules have been kept to a minimum. The "rule of reason" has been used in interpretation. Education and prevention have been emphasized in enforcement.

Success of the program is attributed largely to two factors—advance planning and excellent cooperation from state highway officials, contractors and labor.

• **Law**—The law requires payment of prevailing wages to "laborers and mechanics" employed on the interstate system and applies to all contractors and subcontractors doing "initial construction work." Required rates are in terms of straight time.

The provision is a Congressional extension of the Davis-Bacon Act, which Labor Department Solicitor Stuart Rothman says has been "a stabilizing influence in the construction industry" and a "bulwark of protection for the working man against substandard wages."

Wage determinations for each project—which means each contract—are made by the Secretary of Labor. In making a determination, he is required by law to consult with the highway department of the state in which the project to which it applies is located. Labor Secretaary Mitchell has been determined to see to it that this requirement is carried out to the fullest possible extent. Controlling factor for each determination is project data—rates that have been paid on similar projects in the area.

• **Nothing new**—Because determination of prevailing wages is nothing new, the Labor Department reports that it hasn't had to make any substantial technical or administrative changes for handling wage requests for highway purposes.

It merely has superimposed consultation with state highway officials on existing Davis-Bacon procedure. Hiring of additional personnel to handle the extra workload has been necessary but the new employees have been integrated into the overall operation of the Davis-Bacon and related laws. (Questions have been raised in and out of Congress, however, about the use of Highway Trust Fund money to help defray the extra administrative costs incurred by the department as a result of the program.)

As part of the planning that has spelled success for the program, the Labor Department has taken three steps:

• It has decentralized the work preliminary to determinations by channeling information on highway programing, project wage data and requests for determinations through the department's 10 continental regional attorneys.

• Form DB-11(a) has been introduced for requesting highway wage determinations.

• Form 171 has been devised as the medium for submitting project data by state highway departments.

These procedures have simplified and expedited administration of the law and provided a forum at the local level for participation by all interested parties.

At this level, personal contact with state highway officials is maintained, wage requests are checked for completeness, the supporting wage data is gathered and updated, and conflicts are resolved before the material is sent to Washington for final determination.

It is at this level, too, that lists of prospective contracts giving location and proposed bid date are received from the state highway departments and then forwarded to the Labor Department. In this way the department, at local and national levels, can plan ahead for future requests and avoid bottlenecks that might otherwise occur.

• **Timing**—State highway departments have been asked to submit wage determination requests 30 days before the proposed advertising of bids. (Once issued, a wage determination remains alive for 90 days and then expires unless the contract in question has been awarded.)

Ordinarily, the Labor Department says, it likes to have a 45-day notice of planned requests for wage determinations. Sometimes, however, it is forced to use the "crash" approach—its first highway determination was for the Fitzgerald Expressway in Boston and the determination was put in the mail the day the phone request was received. But highway departments have been urged to plan ahead sufficiently to keep such emergencies to a minimum. For the most part, the department has been able to hold or expedite requests to accommodate both the bid advertising date and the 90-day period.

• **Protests**—Of the 2,614 determinations issued through January 3, 1,330 were rendered after June 28, 1957.

Each of these contains a multiplicity of wage minimums because the determinations must be made on an individual craft basis. The first 2,200 determinations, for example, embraced more than 220,000 minimums.

Mr. Rothman has reported that less than 1% of the minimums established have been challenged. He considers this an "infinitesimal number" compared with the number of determinations issued.

• **Definitions**—To further expedite administration of the program, the Labor Department has from time to time clarified its concept of the terms Congress used in the law. Some of the terms are standard Davis-Bacon phrases; some are new. Present approach to the principal ones are these:

• The law is not considered applicable to clerical, supervisory or nonmanual workers. Criterion is the specific nature of the duties performed, not the arbitrary classification used.

• Rulings have been issued on certain types of relocation and demolition

Barge crane lowers wrought iron conduit into prepared cut in river bottom.

Corrosion resistant Wrought Iron conduit carries new submarine cables across Sheboygan River

To float the conduit into position, 55-gallon drums were strapped to the 12 conduit runs. After positioning, straps were cut, allowing pipe to be lowered into the trench.

Construction activity surrounding the St. Lawrence Seaway extends as far afield as Sheboygan, Wisconsin.

Here, the Wisconsin Telephone Company had to remove old submarine cables from the Sheboygan River bed and install new. This activity preceded dredging operations by the U. S. Corps of Engineers to permit navigation of larger vessels.

Telephone engineers specified six thousand feet of wrought iron pipe fabricated into 12 conduit runs to carry the telephone cables. Interruptions of service would be costly. And it would be difficult to make replacements. So, material selection narrowed to wrought iron because of its outstanding corrosion resistance.

Our publication on wrought iron for cable conduit is available on request. Write for a copy. A. M. Byers Company, Clark Building, Pittsburgh 22, Pennsylvania.

BYERS Wrought Iron Tubular and Hot Rolled Products

ALSO ELECTRIC FURNACE AMBALLOY STEEL PRODUCTS AND PVC PIPE

Corrosion costs you more than Wrought Iron

or removal work, affording guides as to what is "initial construction" and thus covered by the law. General test has been whether the work is incidental to or an integral part of an interstate contract.

• "Immediate locality" is considered a flexible term. Mr. Rothman has said the area is not necessarily a political subdivision and should be large enough "to yield an adequate factual basis for each wage determination, yet be small enough to reflect only the wages and practices of the area immediately surrounding the location of the proposed project."

• "Similar construction" is taken to mean highways or "construction most similar to interstate highway construction" and is not regarded as having effected "any substantial change" in previously existing wage determination procedures.

• **Enforcement**—Primary responsibility for assuring compliance rests with the Bureau of Public Roads. But the Secretary of Labor is responsible for coordinating the enforcement. The Labor Department believes effectiveness of the program lies as much in enforcement as in administration.

Emphasis has been placed on education and prevention. Most common irregularities that have been noted and called to the attention of those engaged in the highway program are:

• Misclassification of workers, such as carrying and paying as a laborer a man who performs the work of a plumber or carpenter.

• Use of apprentices not registered in the federal apprenticeship program.

• Failure to maintain a proper ratio of apprentices to journeymen.

• Failure to post wage determinations at construction sites.

• Performance of work by craftsmen for a lump sum under the guise of a subcontractor.

• Classification of a working craftsman as a foreman and payment of a flat weekly salary regardless of the number of hours worked.

As part of its prevention program, the department has urged preconstruction conferences between the contracting agency and the contractor, and construction site spot checking of classifications against actual work performed.

Apprentice Training Promoted

Bobby Page of Fayetteville, N. C., last month received a $100 Savings Bond and a trophy as the state's champion apprentice bricklayer. Presentation was made by Commissioner of Labor Frank Crane at the Charlotte office, Carolinas Branch, Associated General Contractors of America. AGC, one of the sponsors, contributed the trophy; Brick and Tile Service, Inc., Greensboro, the bond.

Said Mr. Crane: "Both labor and management have demonstrated here today that they have and will continue to make training facilities available to all who will apply themselves."

Union vs Union

NLRB schedules hearing on Burt case dispute

Ten years of jurisdictional friction between one of the building trades unions (sheet metal workers) and a former CIO union (steelworkers) at Burt Manufacturing Co. Akron, Ohio, has gone before the National Labor Relations Board. The Burt Company, which is organized by the steelworkers, makes ventilating equipment.

The Sheet Metal Workers' International Association and four of its locals are accused of unlawfully coercing employees in their right to bargain collectively through representatives of their own choosing. The International and two of its locals are charged with illegal secondary boycott activity.

The NLRB complaint was issued in Cleveland. A hearing is scheduled for February 3. The sheet metal workers have asked for a three-week postponement because the hearing would conflict with the mid-winter meeting of the AFL-CIO Executive Council in Florida next month.

Titular head of all AFL-CIO building trades unions, Richard Gray, has said the case is of "utmost importance to all building trades unions." Walter Reuther, head of the AFL-CIO industrial unions, views it as an example of a practice that should be banned—the boycotting of the products of one union by another union.

A special AFL-CIO committee headed by George Meany said it involves a violation of the AFL-CIO constitution—the raiding of one union by another. But regardless of what it's called, contractors and the public often have been caught in the middle.

• **Activity**—One of the most recent by-products of the feud was an eight-day stoppage of sheet metal work on the $950,000 Student Building addition at the University of Akron.

Contract called for installation of $2,500 worth of Burt equipment. A local of the sheet metal workers union protested.

To break the deadlock, the president of Burt offered to give the equipment to the university. Under this condition, the union was willing to install the equipment and said it might donate its labor.

• **Issue**—To the sheet metal workers the problem is one of protecting their work jurisdiction and their wages and working conditions.

When the issue was aired at the re-

cent convention of the AFL-CIO building trades unions, Mr. Gray made the following report:

• Most of the Akron sheet metal fabrication shops are organized by the sheet metal workers. By means of substandard wages, the steelworkers, in the Burt case, have invaded their jurisdiction. As a result, the sheet metal workers have attempted to influence and persuade sheet metal contractors to fabricate sheet metal products themselves or else use sheet metal products of fabricators and manufacturers who hire sheet metal workers. These are measures of self-preservation, not efforts to organize Burt or raid its steelworkers.

• Mr. Gray referred to Mr. Reuther's "battle cry of boycott" as a "smoke screen to divert attention from the real issues in controversy"—jurisdiction and protection of wage scales and working conditions. He said if the building trades lose the Burt case, then other industrial unions can invade boilermaker shops, carpenters' mill shops, plumbers' fabrication shops and so on at reduced wage scales to the detriment of the work jurisdiction, wage scales and working conditions of all construction unions.

The case is already a critical one in AFL-CIO internal relationships and may well split the federation in its approach to forthcoming federal legislative proposals.

High Court Invalidates An Organizing Ordinance

A Georgia ordinance requiring the licensing of union organizers was declared unconstitutional last week by the U. S. Supreme Court.

The measure, which is one of several that has impeded union membership drives in the South, was found invalid on its face. It had been adopted in Baxley.

Union organizers were required by the ordinance to obtain from the mayor and city council permits costing $2,000 a year before they could solicit members. An additional fee of $500 was imposed for each member obtained.

The court viewed the ordinance as an "unconstitutional censorship or prior restraint upon the enjoyment" of the freedoms guaranteed by the First Amendment and as a violation of the Fourteenth Amendment, which prohibits states from depriving people of liberty without due process of law.

Such ordinances have been under attack by the building trades unions for several years. They have been cited as part of an open shop effort on the local political level to weaken and destroy all trade unions.

DUMPCRETES help solve heavy traffic problem on DETROIT EXPRESSWAY job

The Cooke Contracting Company worked Dumpcretes during off-peak traffic hours to average 2500 feet of concrete pavement per day in widening Detroit Industrial Expressway. Highway Department check showed 500 vehicles passing the paving site *each hour*. 14 miles of 8′ to 12′ widths totalled 110,000 sq. yds.—hauled and placed by 6 Dumpcretes from central plant.

GET MORE FACTS ON THIS JOB BY SENDING COUPON

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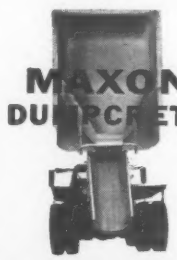
Capital investment in equipment • Confusion at paving site • Downtime and labor costs • Wide shoulder maintenance.

Dumpcretes can give you:
Lower operating costs • *Flexible* delivery to paving site *and* structures • Closer quality control • Better production.



MAXON CONSTRUCTION COMPANY, INC.
Manufacturing Division 28
2600 Far Hills Building, Dayton 9, Ohio

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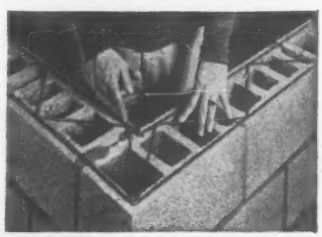

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Can Wage Boosts Stop Recession?

Withdrawal of wage freeze proposal and other events tie National prosperity to consumer purchasing power

The belief that wages, hours, fringe benefits and working conditions must continually be improved to bolster the nation's lagging economy is receiving increasing support in and outside the ranks of organized labor.

Coupled with this are new pleas for a better understanding of economic facts and a greater sense of social responsibility in collective bargaining.

Within the last few weeks, AFL-CIO building trades' President Richard Gray has officially withdrawn a personal proposal for a 1958 voluntary wage freeze by construction workers and has announced his "100%" support of an AFL-CIO resolution to press for "higher wages to bolster present inadequate consumer buying power to restore needed national economic growth."

Dedicated to the same goal, Walter Reuther, head of the United Auto Workers union, has proposed for the auto industry a two-package approach to the union's 1958 economic demands —noninflationary improvements in wages and benefits, and a profit sharing scheme for the benefit of stockholders, workers and consumers. (Mr. Reuther has long maintained that the current recession stems from the artificial rigging of prices by dominant corporations that have, at the same time, expanded their productive facilities through profits rather than risk capital to a point beyond the nation's ability to consume.)

Meanwhile, the Conference on Economic Progress, a nonpartisan study group, has issued a report by economist Leon Keyserling blaming inflation on corporate pricing policies and excessive profits rather than on wages, and recommending higher wages and higher consumption, coupled with larger government spending and low-income-bracket tax cuts, to stimulate our economy.

Last week, a New York bank president urged "new financial and economic techniques to control our overall price level" and has labeled as ineffective the use of general credit controls by the Federal Reserve System.

And President Eisenhower, first official to caution against wage and price increases, has just asked Congress for a military pay boost of $518 million, is favoring a 6% across-the-board wage increase for postal and other federal employees and, in his 1959 Budget Message last week, recommended improvements in minimum wages, unemployment compensation, apprentice training and revisions in the law governing hours of work on federal construction projects.

Along with these developments has come a steady climb in unemployment, which reached an eight-year December high of 3,374,000, and in the cost-of-living. (The November Consumer Price Index stood at 121.6—a 20.8 increase over the 1949 average of 101.8.)

Net result is to inject into 1958 collective bargaining a number of complex and critical issues challenging the intellect, imagination and integrity of all who approach the bargaining table. They range through broad fields of wages, prices and profits, federal fiscal and taxing policies, economic justice, morality and social responsibility. And they all bear on a single question, now underscored by the prospect of a total cold war—how inseparable are the interests of labor, management and the public?

In dropping his wage freeze proposal, Mr. Gray candidly summed up the challenge this way: "This entire subject, of course, is a pro and con argument and I am not sure, because of its complex nature, that it can be fully understood or made clear to all our people. . . . We must find a way to not only increase employment and the purchasing power of the consumer, but we must, at the same time, strive to reduce the ever increasing cost of living."

Labor Briefs . . .

• **Strikes end**—A two-year contract calling for two 10 cent wage increases has ended a 10 day strike of laborers in two western Arkansas counties. And in Scranton, Pa., plumbers won a 15 cent wage boost and returned to work after a week's stoppage.

• **Friction**—Building trades unions in Buffalo, N. Y., have resisted Republic Steel Corp. efforts to put two outside contractors on a four-day week. Company steelworkers are on a 32 hour week and the company felt it wasn't "right to have outside contractors' employees in here working a greater amount of hours than our own employees." Work under outside contract consisted of blast furnace rebuilding and gas cleaning equipment installation.

OFFICIAL PROPOSALS

Bids: January 30, 1958

Artificial Beach Nourishment at Far Rockaway

NOTICE TO CONTRACTORS

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Public Building Law and Highway Law, sealed proposals will be received, until 10:30 A.M., E.S.T., January 30, 1958, by Henry A. Cohen, Director, Bureau of Contracts, 14th Floor, the Governor Alfred E. Smith State Office Building, Albany, N. Y. for:

Contract B.P. 58-58 for Beach Protection Artificial Beach Nourishment at Far Rockaway, The Rockaways, City of New York, Queens County, New York.

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 14th Floor, The Gov. Alfred E. Smith State Office Bldg., Albany, New York.

(b) Department of Public Works, 270 Broadway, New York City, N. Y.

(c) In addition to the above mentioned offices, plans, maps and specifications for Contract B.P. 58-58 may be examined and obtained at the office of Mr. Milton E. Goul, 325 W. Main Street, Babylon, L. I., New York.

The deposit for Plans and Proposal Forms for Contract B.P. 58-58 is $10.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

The Engineer's Estimate of Cost for Contract B.P. 58-58 is $750,000.00.

Proposals for Contract B.P. 58-58 must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check, payable to the order of the State of New York, Commissioner of Taxation and Finance for the sum of $40,000.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Public Building Law and to the Highway Law as set forth in "Instructions to Bidders" in the contract specifications.

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

Bids: March 10, 1958

Youth Center Building

Sealed proposals for Building, Mechanical, and Electrical Work for the Youth Center Building, Dearborn Civic Center, Dearborn, Michigan, will be received by the City of Dearborn, Michigan, at the office of the City Clerk in the Municipal Building, Michigan Avenue and Schaefer Road, until 2:00 P.M. March 10, 1958 and will immediately thereafter be publicly opened and read aloud.

One award will be made for building, mechanical, and electrical work.

The contract documents are on file and may be examined at the office of the Architects and Engineers during business hours. Copies of the documents may be obtained by depositing at the Architects and Engineer's office cash or check in the amount of $30.00, which amount will be refunded if the complete documents are returned in good condition within 10 days after the opening of bids.

Proposals must be submitted in the form provided therefor by the Architects and Engineers. A certified check or a cashier's check payable to the City of Dearborn, Michigan, in an amount not less than 5 percent of the base bid, shall be submitted with each proposal, subject to the conditions set forth in the Instructions to Bidders.

The accepted bidder will be required to execute performance and lien bonds, each for the full amount of the contract.

No proposal may be withdrawn for at least 60 days after the scheduled closing time for receipt of proposals.

The City of Dearborn reserves the right to waive any informality in any bid, or to reject any or all bids, in whole or in part, should it be deemed for its best interests so to do.

CITY OF DEARBORN, MICHIGAN
JOSEPH CARDINAL
City Clerk

Harley, Ellington & Day,
Architects and Engineers
153 E. Elizabeth St.
Detroit 1, Michigan

OFFICIAL PROPOSALS

RATE: The rate for Official Proposal advertising is $2.40 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.

SEND COPY TO: Official Proposal Division, Engineering News-Record, P.O. Box 12, New York 36, N. Y.

Bids: January 30, 1958.

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., eastern standard time on the 30th day of January 1958, by Henry A. Cohen, Director, Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1; G. L. NICKERSON; District Engineer, 353 Broadway, Albany 1, New York						
Saratoga	FISH 58-24 FARC 58-17	Interstate Route 502, Sect. 2, Cont. 3 (Mohawk River to Clifton Park); Lapes Corners–Clifton Park, S.H. 8137; Mechanicville–Clifton Park, S.H. 1345 and various Cross and Access Roads Project I-1119(11); S-202(3)	6.45 (5.93 ACC.)	9" Cem. Conc. Pavt. 2 @ 30' Var. Wide=9.10 Miles Asphalt Concrete=1.52 Mi. Graded Gravel Top Course=1.28 Mi. Misc. Work=0.48 Mi. 5 Hy. Sepa. Comp. I-Beams 305'; 350'; 344.7'; 320' and 156.5'	$360,000 Plans $20	$6,533,000
DISTRICT No. 8; K. G. RAUER; District Engineer, Pleasant Valley Road, Poughkeepsie, New York						
Putnam	FESS 58-17	Farmers Mills Road, C.R. 402 Proj. ER-83(1)	0.18	Bit. Surf. Treat. Granular Bottom Course Comp. I-Beam Bridge 40'	$5,000 Plans $2	$87,000
Putnam	FESS 58-18	Peekskill Hollow Road, C.R. 201 Church Street, C.R. 202 Project ER-89(1); ER-90(1)	0.40	Bit. Surf. Treat. Granular Bottom Course 2 Comp. I-Beam Bridges 76' and 61'	$23,000 Plans $3	$417,000
DISTRICT No. 10; M. E. GOUL; District Engineer, 325 W. Main Street, Babylon, L.I., New York						
Bronx	FICBE 58-2	Cross Bronx Expressway, Cont. 6, (Clay Avenue to Fulton Avenue) and various Cross Streets and Service Roads Project I-U-1084(30)	0.45 (0.74 ACC.)	9" Cem. Conc. Pavt. with Carb. Black 2 @ 39' Var. Wide=0.38 Mi. Sheet Asphalt Pavt.=0.69 Mi. Granite Block Pavt.=0.05 Mi. Misc. Work=0.07 Mi. Viaduct Comp. Plate Girders 1566.8'	$320,000 Plans $20	$5,863,000
Nassau	PSC 7278	Elimination of Grade Crossings of the Long Island Railroad with various Streets in Freeport	2.26 (0.56 ACC.)	Track Relocation, Freight House, Station and Misc.=2.26 Mi. 9" Cem. Conc. Pavt. Var. Wide=0.50 Mi. Asphalt Concrete Pavement=0.06 Mi. 7 R.R. Seps. Plate Girders 80', 78'; 76'; 87', 86.5'; 117.5'; and 100' 1 Viaduct 1874'	$361,000 Plans $20	$6,565,000
Nassau and Suffolk	SSPRC 58-1	Southern State Parkway, Cont. 8A	4.41	Landscaping	$14,000 Plans $3	$251,000
Queens	P.S.C. T.C. 3518, 3519; 3607	Elimination of Grade Crossings of the Long Island Railroad with Various Streets (Old Southern-Rosedale, Westerly Section) (South Road, Jamaica to Springfield Boulevard, Laurelton)	3.18 (0.68 ACC.)	Track Relocation and Misc. Work=3.18 Mi. Asph. Conc. Pavt.=0.68 Mi. 9 R.R. Seps. Plate Girders 79', 94', 101'; 186', 98', 93.5'; 106.5', 89', 133.5' 2 Ped. Underpasses W.F. Beam 34' Each	$400,000 Plans $20	$7,635,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage) Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Instructions to Bidders".

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

Bids: January 28, 1958

Power Authority of the State of New York

ADVERTISEMENT FOR PROPOSALS
For Construction of
Dike Relief Wells, Dike Observation Wells
And
Groundwater Investigation Wells
St. Lawrence County, New York
Specifications No. PA-5-11035
St. Lawrence Contract No. 44

NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for Construction of Dike Relief Wells, Dike Observation Wells and Groundwater Investigation Wells, St. Lawrence County, New York, until 10:30 A.M. Eastern Standard Time on the 28th day of January, 1958, at the Authority's office, 18th floor, the Coliseum Tower, 10 Columbus Circle, New York 19, New York, at which time and place the proposals will be publicly opened and read aloud.

The principal items of work are:

Estimated:

Constructing relief wells	600 lin. ft.
Furnishing and installing 6 inch diameter plastic pipe	2000 lin. ft.
Constructing observation wells (including installing 2 inch plastic pipe)	900 lin. ft.
Drilling and casing 6 inch I.D. wells	1100 lin. ft.
Drilling 5¼ inch diameter wells below casing	500 lin. ft.
Furnishing and installing 2 inch riser pipe	300 lin. ft.

All work shall be completed on or before July 1, 1958.

Plans, Specifications and Proposal Forms for the work may be obtained from the Power Authority of the State of New York, at the 18th floor, the Coliseum Tower, 10 Columbus Circle, New York 19, New York, upon application and prepayment of a fee of Ten Dollars ($10.00) per initial set of contract documents, and Five Dollars ($5.00) per set for additional sets, no part of which will be refunded. Plans, Specifications and Proposal Forms for the work will be on file in the Authority's office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and the Hydro-Electric Power Commission of Ontario, 620 University Avenue, Toronto 2, Ontario, and may be inspected by prospective bidders during office hours.

Bids must be made and returned in duplicate in accordance with instructions contained in the Information for Bidders. Guarantee will be required with each bid in an amount not less than 20 percent of the maximum price bid for any bid schedule.

The right is reserved to make award on any one or more of the above schedules, separately or in combination, as fully described in the Proposal, and to reject any or all bids.

W. S. CHAPIN
GENERAL MANAGER

OFFICIAL PROPOSALS

Bids: January 30, 1958

The Furnishing and Delivery of 130 MVA Two-Winding Power Transformers for Reynolds Substation

Power Authority of the State of New York
Supplemental Transmission
ADVERTISEMENT FOR PROPOSALS
for
Specification No. PA-8-4
Contract No. TP13

NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the design, manufacture and furnishing of three (3) 130 mva two-winding transformers and associated equipment and delivery thereof, f.o.b. cars at destination until 10:30 A.M. Eastern Standard Time on the 30th day of January, 1958 at the Authority's office, 18th floor, The Coliseum Tower, 10 Columbus Circle, New York 19, New York, at which time and place proposals will be publicly opened and read aloud.

Bids will be received for the transformers and associated equipment and services in accordance with the bidding schedule. Installation of the transformers and associated equipment will be done by Others, but services of erecting engineers shall be provided by the manufacturer when and if required. Delivery of the transformer and associated equipment will be required October 1, 1958.

Plans, Specifications and Proposal Forms may be obtained only from the Power Authority of the State of New York, The Coliseum Tower, 10 Columbus Circle, New York 19, New York, upon application and prepayment of a fee of Ten Dollars ($10.00) for initial set of Contract Documents and Five Dollars ($5.00) for each additional set, no part of which will be refunded. Two sets must be returned with each bid.

Plans, Specifications and Proposal Forms for the work will be on file in the Authority's office and in the office of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, for the inspection by prospective bidders.

Bids will not be restricted to American manufacturers.

Bids must be made in duplicate in accordance with instructions contained in the Information for Bidders. Guarantee will be required with each bid in an amount not less than twenty (20) percent of the gross sum bid.

The right is reserved to reject any or all bids.

W. S. CHAPIN
GENERAL MANAGER

Bids: March 7, 1958

Construction of S.E. Third Ave Bridge Fort Lauderdale, Florida

Sealed bids or proposals, addressed to City of Fort Lauderdale, Florida, and marked Project No. 627 "S.E. Third Avenue Bridge across New River" will be received at the office of the City Commission of Fort Lauderdale, City Hall, Fort Lauderdale, Florida, until 11:00 A.M., E.S.T., March 7, 1958, and at twelve o'clock noon on said date they will be publicly opened and read aloud.

The project consists of the construction of a double leaf rolling lift bascule span with all its appurtenances, steel and prestressed concrete approach spans, and filled approaches between retaining walls.

Instructions to Bidders, Proposal, Form of Agreement, Form of Construction Bond, Specifications, and the Plans may be examined at the office of the City Engineer, City Hall Annex, City of Fort Lauderdale, Florida, on and after 9:00 A.M., January 7, 1958, or copies of same may be obtained there.

Plans and specifications may also be examined at the offices of J. E. Greiner Company, 1106 N. Charles Street, Baltimore, Maryland and J. E. Greiner Company and Associates, First National Bank Building, Tampa, Florida.

A deposit of $25.00 will be required for each copy of the Contract Documents which deposit will be refunded, to bidders, upon return of the Documents in good condition, within ten days after the opening of bids.

Each proposal must be accompanied by a certified check in the amount of 2% of the total amount of the bid, made payable jointly to City of Fort Lauderdale, Florida and the bidder, (i.e., City of Fort Lauderdale, Florida or John Smith, Inc.) as assurance that the bid is made in good faith. This check shall be retained by the City as liquidated damages should the bidder refuse or fail to enter into a contract with the City for the execution of the work, in the event the proposal of the bidder is accepted.

Public Liability and Property Damage Insurance and Construction Bond will be required.

The City Commission reserves the right to waive any informalities in or reject any or all bids and to accept the bid most favorable in the interest of the City, after all bids have been examined and canvassed.

W. J. Veeder
City Manager

January 7, 1958

Bids: January 30, 1958

Contract U.S.-96, Erie Canal

NOTICE TO CONTRACTORS

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Barge Canal Improvement Law and Highway Law, sealed proposals will be received, until 10:30 A.M., E.S.T., January 30, 1958 by Henry A. Cohen, Director, Bureau of Contracts, 14th Floor, the Governor Alfred E. Smith State Office Building, Albany, N. Y. for:

Contract U.S.-96 for New Gates, Lining the Lock Wall and Miscellaneous Work at Lock 21, Erie Canal, Oneida County, New York.

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 14th Floor, The Gov. Alfred E. Smith State Office Bldg., Albany, New York.

(b) Department of Public Works, 270 Broadway, New York City, N. Y.

(c) In addition to the above mentioned offices, plans, maps and specifications for Contract U.S.-96 may be examined and obtained at the office of Mr. Lacy Ketchum, 109 North Genesee Street, Utica 1, New York.

The deposit for Plans and Proposal Forms for Contract U.S.-96 is $15.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

The Engineer's Estimate of Cost for Contract U.S.-96 is confidential and will be made known at the time of receiving bids. Proposals for Contract U.S.-96 must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of five percentum, (5%) of the bid. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Barge Canal Improvement Law and to the Highway Law as set forth in "Instructions to Bidders" in the contract specifications.

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

Bids: January 30, 1958

Contract U.S.-95 for Lock 12, Erie Canal

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Barge Canal Improvement Law and Highway Law, sealed proposals will be received, until 10:30 A. M., January 30, 1958 by Henry A. Cohen, Director, Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for:

Contract U.S.-95 for New Gates and Lowering the Lower Sill at Lock 12, Erie Canal, Tribes Hill, Montgomery County, New York

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 14th Floor, The Gov. Alfred E. Smith State Office Bldg., Albany, New York.

(b) Department of Public Works, 270 Broadway, New York City, N. Y.

OFFICIAL PROPOSALS

(c) In addition to the above mentioned offices, plans, maps and specifications for Contract U.S.-95 may be examined and obtained at the office of Mr. Lacy Ketchum, 109 North Genesee Street, Utica 1, New York.

The deposit for Plans and Proposal Forms for Contract U.S.-95 is $10.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

The Engineer's Estimate of Cost for Contract U.S.-95 is confidential and will be made known at the time of receiving bids. Proposals for Contract U.S.-95 must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of five percentum, (5%) of the bid. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Barge Canal Improvement Law and to the Highway Law as set forth in "Instructions to Bidders" in the contract specifications.

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

U. S. Government

Sealed bids for construction (except elevator) of the Auditorium, Fine Arts Building, Howard University, Washington, D. C., will be received until 2:00 PM EST February 19, 1958 in Rm. 7100 GSA Regional Office Bldg., 7th & D Sts., S. W., Washington, D. C., and then publicly opened in Rm. 7100. Contractors interested in bidding the entire project may obtain three sets of bidding material without a deposit; two additional sets by depositing $35.00 for each set. Bidding material is available in Rm. 1304 General Services Bldg., 19th & F Sts., N. W., Washington 25, D. C. Phone EX-3-4900, Extn. 2397. Commissioner of Public Buildings, General Services Administration.

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OFFICIAL PROPOSALS

Bids: January 30, 1958

Soil Explorations and Foundation Investigations

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 a.m. Eastern Standard Time, on January 30, 1958, by Henry A. Cohen, Director, Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for:

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON INTERSTATE ROUTE 505, INTERCHANGE AREA AT COUNTY HIGHWAY 34 TO INTERSECTION WITH ROUTE 12, ABOUT FOUR MILES SOUTHWEST OF ALEXANDRIA BAY VILLAGE, SECTION 7E, OMAR SWAMP, PROJECT 1-1118(3), JEFFERSON COUNTY, WHICH CONSTITUTES CONTRACT NO. SPEC. FA-SM-116.

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, N. Y.
(b) Mr. Robert W. Sweet, District Engineer, New York State Department of Public Works, 444 VanDuzee Street, Watertown, New York.
(c) Mr. William M. Trainer, Associate Contract Engineer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50 percent of deposit.
The Engineer's Estimate of cost for this work is $15,502.50.
Proposal for this contract must be submitted in seperate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $1,000.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instruction to Bidders."
The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPERINTENDENT OF
PUBLIC WORKS

U. S. Government

Sealed bids will be received in the office of the Engineering and Construction Director, Panama Canal Company, Balboa Heights, Canal Zone, until 1:00 P.M., February 10, 1958 and at that time will be publicly opened, for the work and material required in the modernization of the Administration Building, Balboa Heights, Canal Zone. The work consists of installation of a new power feeder, replacement of all lighting fixtures and wiring, installation of suspended ceilings, replacement of elevator, and complete air conditioning of the building. Data are available for examination in the office of Chief, Procurement Division, Panama Canal Company, 21 West St., New York 6, N. Y. Complete sets may be obtained by prospective bidders upon payment of $25.00 deposit which will be refunded when data are returned within 40 calendar days after bid opening. Telephone Bowling Green 9-5380, extension 130.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5011) will be received at Albuquerque, New Mexico until February 18, 1958, for furnishing labor and materials for modifications of existing culverts at Stations 250+73, 640+19, and 967+30, Socorro Channelization, Middle Rio Grande Project, New Mexico. Location near Socorro, New Mexico. Principal items are 12,300 cu. yds. excavation for culverts and overflow; 90,700 cu. yds. constructing embankments; 85 Mbm timber headwalls; 116 lin. ft. 15-foot by 9-foot pipe arches; 12 steel slide gates, 86-inch by 76-inch; and other work. Completion time 120 days. For particulars, address Bureau of Reclamation, P. O. Box 252, Albuquerque, New Mexico; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

OFFICIAL PROPOSALS

Bids: February 4, 1958

Contract BP-502.238

THE PORT OF NEW YORK AUTHORITY
BROOKLYN-PORT AUTHORITY PIERS
PIER 3
BORINGS

Sealed propasals for making borings and taking samples at the site of Pier 3 to be constructed at the Brooklyn-Port Authority Piers will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, February 4, 1958, at which time said proposals will be opened and read in Room 1108.

Contract Documents may be seen at the office of the Engineer of Deisgn of the Authority, Room 1115, and copies will be furnished upon request. No deposit will be required but the documents shall be returned in good condition not later than forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, January 23, 1958

OFFICIAL PROPOSALS

Bids: February 4, 1958

Contract BT-120.016

THE PORT OF NEW YORK AUTHORITY
PORT AUTHORITY BUS TERMINAL
ALTERATIONS FOR TRAVEL BUREAU

Sealed proposals for the performance of interior alterations for a Travel Bureau in the Main Concourse in the Port Authority Bus Terminal at 625 Eighth Avenue, New York, New York, will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, February 4, 1958, at which time said proposals will be opened and read in Room 1108.

Contract Documents may be seen at the office of the Engineer of Design of the Authority, Room 1115, and copies will be furnished upon request. No deposit will be required but the documents shall be returned in good condition not later than forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, January 23, 1958

EMPLOYMENT OPPORTUNITIES

REPLIES (Box No.): Address to office nearest you
c/o This publication Classified Adv. Div.
NEW YORK: P. O. Box 12 (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

Superintendent thoroughly qualified, large sewer & watermain installations. Permanent, N. Y. State. P-6844, Engineering News-Record.

Experienced Estimator—General Contractor, commercial, industrial, civic and school construction, $100,000 and over, New Hampshire Civil Engineer or equivalent. Send resume of education, experience and salary required to P-6722, Engineering News-Record.

Help Wanted—Male Experienced Graduate Engineer for structural steel take-off and estimating. Box 955, New Haven, Conn. Must hold, or be able to procure immediately, Conn. State License.

Engineers qualified by experience for positions as resident engineers on sewer construction, also well qualified inspectors for Ohio municipal projects. P-6960, Engineering News-Record.

Civil and sanitary engineers qualified by training and experience on design of municipal water and sewage treatment projects. Please provide complete information and references. Old consulting organization. P-6972, Engineering News-Record.

Construction superintendent, thoroughly qualified in estimating and field supervision. Must have experience and references. Steady employment. Iowa and Illinois location. State education and expected salary. P-6964, Engineering News-Record.

Assist. Prof.—To teach undergrad. courses in surveying and highway engineering. Salary depends on qualifications. Dept. of Civil Eng., Univ. of N. Dakota, Grand Forks, N. Dak.

Wanted—Experienced Engineers to prepare plans for Water Filtration Plants and/or sewage Treatment Plants. State experience, salary requirements and when could report. P-7015, Engineering News-Record.

Assistant Town Engineer—Civil Engineer, graduate of a four year College, registered professional Engineer, 3 to 5 years experience in Municipal Public Works. Starting salary range $4888.00 to $5928.00. Submit resume and application to Supt. Public Works, Administration Building, Agawam, Mass.

Estimator—Public, Industrial and Commercial building construction. Top salary for top man. Location Northern Ohio. P-7104, Engineering News-Record.

Structural Steel Detail Draftsman. One or two years experience—structural or miscellaneous steel. Good starting rate, vacation, hospitalization-accident-life insurance plan. Send brief resume to: Chief Engineer, Michigan Fabricating and Welding, Inc., P. O. Box 567, Jackson, Michigan.

POSITIONS VACANT

Detailer & Checker Structural Steel. Must be experienced. Hospitalization and retirement benefits. Give references, age, and salary expected in application. Barber & Ross Company, 2323-4th Street, N.E., Washington, D. C.

Position Available—Male. Wanted—mechanical engineer with broad experience in excavating machine design, particularly trenching machines. Position particularly suited to senior citizen who is looking for Southern California location. Apply P-7062, Engineering News-Record, giving full resume.

Asphalt Plant Supt: Must know Plant set-up, material control and lay down operation. Permanent, Kansas. P-7076, Engineering News-Record.

Sewer Supt: Must know machinery, all types excavation, able to travel, permanent. Kansas-Nebraska. P-7077, Engineering News-Record.

Gravel Production Supt: Able to locate pits, set-up plant and produce to State specifications. Permanent, Kansas. P-7078, Engineering News-Record.

Engineer-Estimator: Northwestern Ohio and Southern Michigan. Bridges, concrete, piling, excavating, sewers. Ability to supervise work desirable, but not essential. Salary plus job bonus. Small organization, but opportunity as large as you make it. P-7079, Engineering News-Record.

Wanted—Licensed Civil Engineer for County Engineer. State age and experience. Greenfield, Adair County, Iowa.

Chief Draftsman, struct. eng. or arch'l. reasonably familiar with struct. design. Principal duties, other than supervising draftsmen: coordination of struct., architectural, and mech. drwgs. Should have at least 10 yrs. experience, considerable executive ability, and be able to get along with people. Salary up to $12,000 a year, depending upon ability, plus profit-sharing arrangement. Must have best references. Purchase of stock in company optional. Location large Southern city. P-7067, Engineering News-Record.

Sales Manager and sales force wanted for large prestressed concrete manufacturing firm in Florida. Engineering background desired. Contact P-7073, Engineering News-Record giving full background information and desired salary, etc.

Arlington Heights, Ill. (Approx. 23,000) Vil Eng. Eng. degree, Ill. license and considerable exp. in municipal Design and Construction. Age 30-50 yrs. Salary open. Apply F. R. Buechner, Vil. Manager.

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(Continued on the following page)

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(Continued from preceding page)

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Construction Engineer B.C.E. 9 years experience in building construction, field and office engineering, field supervision, expediting, estimating and project engineer. Reply PW-6934, Engineering News-Record.

Construction Sup't., Chief Engineer, graduate, 12 years exp. harbors, pile driving, mining and metallurgical plants, industrial const. 7 yrs. foreign exp. prefer foreign pos. PW-6990, Engineering News-Rec.

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Project Manager or Superintendent for architect or contractor available February. Now completing luxury type 325 room El San Juan Hotel. Working knowledge Spanish and French. Also experienced heavy construction and housing. Age 44, single. Airmail replies to: Allen McSherry, P.O. Box 6034, Loiza Station, Santurce, Puerto Rico.

Superintendent or Estimator thoroughly experienced and qualified to handle all phases of job from bid to completion: Sewage and Water Treatment Plants, Power Plants, Building Const., Bridges, Foundations, Cofferdams, Piling, Reinforced Concrete. PW-7010, Engineering News-Record.

Construction Superintendent now employed desires change. Industrial, commercial, chemical plants. Atlantic States preferred. PW-7020, Engineering News-Record.

Field Engineer—Asst. Supt.—Age 27, 9 yrs. exp.—Hwys., bridges, bldgs. Good N.Y.C. labor connections in bldg. const. want steady position—good references—available Feb. 1st. PW-7023, Engineering News-Record.

Canadian Consulting Engineer, civil, seeks short term foreign jobs. Salary or fee basis. PW-7025, Engineering News-Record.

Construction Superintendent now employed desires job with general contractor on estimating, sub-contractors, shop drawings, scheduling, costs, etc. PW-7034, Engineering News-Record.

Supt. for Gen. contracting firm with an annual volume or potential of 5 to 15 million dollars in buildings, state hospitals, extensive exp. in Capehart Housing. Age 37, single, willing to travel. I get results. Seeking permanent position with reliable Co. Available after Jan. 1958. PW-6915, Engineering News-Record.

Chief Draftsman with structural fabricating plant experience desires similar or chief engineer position with established fabricating company. Heavy and light structural experience. PW-7044, Engineering News-Record.

M.E. Reg. Minn. Age 40, 20 yrs. exp. Pwr. piping Blrs., Turbines, Design exp. Est. Const. Exect. Ability. PW-7045, Engineering News-Record.

(Continued on opposite page)

POSITIONS WANTED

(Continued from opposite page)

Architectural draftsman. 29, desires position as assistant-clerk-of-works, 9 years architectural experience, will travel anywhere, United States or abroad, excellent references. PW-7046, Engineering News-Record.

Office Manager—Purchasing Agent. Broad experience, industrial, heavy and marine construction. Complete organization and supervision of all administrative, purchasing, warehousing, expediting, security, safety etc. on projects in excess of ten and twenty million dollars. Location immaterial, bondable and immediately available. PW-7047, Engineering News-Record.

Construction Engineer, 31, C.E., P.E., experienced light, heavy, & highway construction. Desires permanent position with bridge & highway contractor. Do estimating construction design, planning, scheduling, & purchasing. Available immediately. PW-7048, Engineering News-Record.

Young graduate civil engineer. One year experience in highway and dam survey work, presently employed by internationnl heavy construction firm, desires more challenging position with highway or heavy contractor or consultant. PW-7060, Engineering News-Record.

Dredging Engineer. All phases for port, harbor, channel and river work. Layout, design, supervision, operation, hydro and land surveys, inspection. Individual services or with supporting personnel. Will contract for work anywhere in world. John Huston, Corpus Christi, Texas. TUlip 3-1201, TErminal 5-0742.

Civil Engineer, 26, B.S.C.E., P.E. license in New York State, 5 years structural design experience. Seeks position as manufacturers representative on east coast. PW-7071, Engineering News-Record.

Civil Engineer, Registered—9 years experience in Industrial and Heavy Construction. Desire challenging position with Contractor or firm engaged in design and construction. PW-7065, Engineering News-Record.

Cost Engr. BS, age 36, 10 yrs constr. & engr. experience (some supervisory), field & office. Planning, estimating, scheduling, cost control. Refineries, power & chemical plants, steel mills. U. S. or Foreign. Available Feb. 1st. PW-7080, Engineering News-Record.

Civil Engineer—graduate, registered, 7 years construction and design of highways, concrete and steel structures. 1 year instructor and grad work in soils. Speak Spanish. Qualified Field, or Designing Engineer, Domestic or Foreign. Collier, 4 Barnes Rd., Tarrytown, N. Y.

Contractor's Assistant, competent estimator-job manager, graduate engineer, 32, seeks position of responsibility with medium or Middle Atlantic States. PW-7105, Engineering News-Record.

Road Cons't. Supt., age 41. 23 yrs. experience in heavy grading, bituminous and concrete paving on roads and airports; engineering background. Able to take complete charge of all phases of job. Prefer South. Available Jan. 1. PW-6845, Engineering News-Record.

Expediting Engineer, 37, extensive experience as purchasing agent & Chief Inspector & Expeditor for leading American construction engineers on recent well known large chemical & industrial projects in U. S. & Europe. John Claridge, 1417 N. Quinn, Arlington, Va.

Superintendent: 48, broad experience in all phases of buildings, irrigation projects, railroads and general construction. Knowledge of Spaniah. Prefer foreign work. PW-7109, Engineering News-Record.

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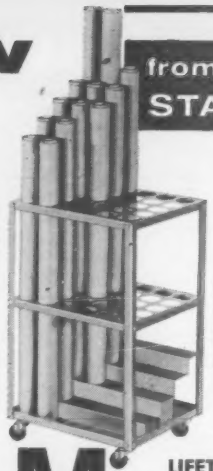

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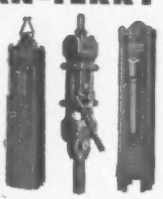

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Highways: No Boon to Cities

LET IT BE SAID LOUD AND CLEAR and often enough to sink into everyone's mind: The great new national highway program won't solve traffic problems in the cities of the United States. In fact, it could strangle them with still more vehicular traffic.

No highway program—however big, however elaborate—is of itself the answer to the traffic problems of the great cities. A highway program alone can only bring more and more vehicles to the city's already overcrowded streets, creating even greater congestion.

There's a peculiar blind spot in this matter that seems to affect not only the general public and municipal officials—but also many engineers.

The blind spot is in the matter of what must be transported to the cities. What must be brought in is **people**—not vehicles, **people.** Considerations of keeping the city alive, getting its work done, are concerned primarily with people, not with what transports them.

And when the traffic problem is recognized as primarily one of moving people, the answer is not hard to find. The answer is mass transportation, rapid transit and railroads. There is no need to argue the point: A single track can carry more people than a 20 lane highway, someone has figured.

We hold no brief for highways vs. rapid transit—both play their part and both make business for construction men. And, while rapid transit passage is paid for by the user, there is truly no such thing as a "free" road—all highway costs must be paid by someone, of course.

But there is this difference: In many city areas, the rapid transit facilities exist. They may be outmoded and rattling—but they exist. It may often be cheaper to refurbish them—to handle more people—than build new intra-city highways. It may be cheaper, in fact, to subsidize rapid transit, which seems a necessity now, than to build more arteries that will pour still more traffic into the hearts of our cities. And, if subsidy is necessary, think of it in the proper perspective: as spending for the movement of people—not as subsidy to a given railroad or rapid transit line, but as a subsidy to **people,** and to the city itself.

Underdevelopment Snag

ONE OF THE MOST CRITICAL PROBLEMS in aiding underdeveloped countries is in using available development funds to raise the standard of living of the poor, rather than benefit the already amply wealthy, who are invariably in the political saddle. In a majority of the cases it is precisely because of an economic system making the rich richer and the poor poorer that these countries have remained underdeveloped.

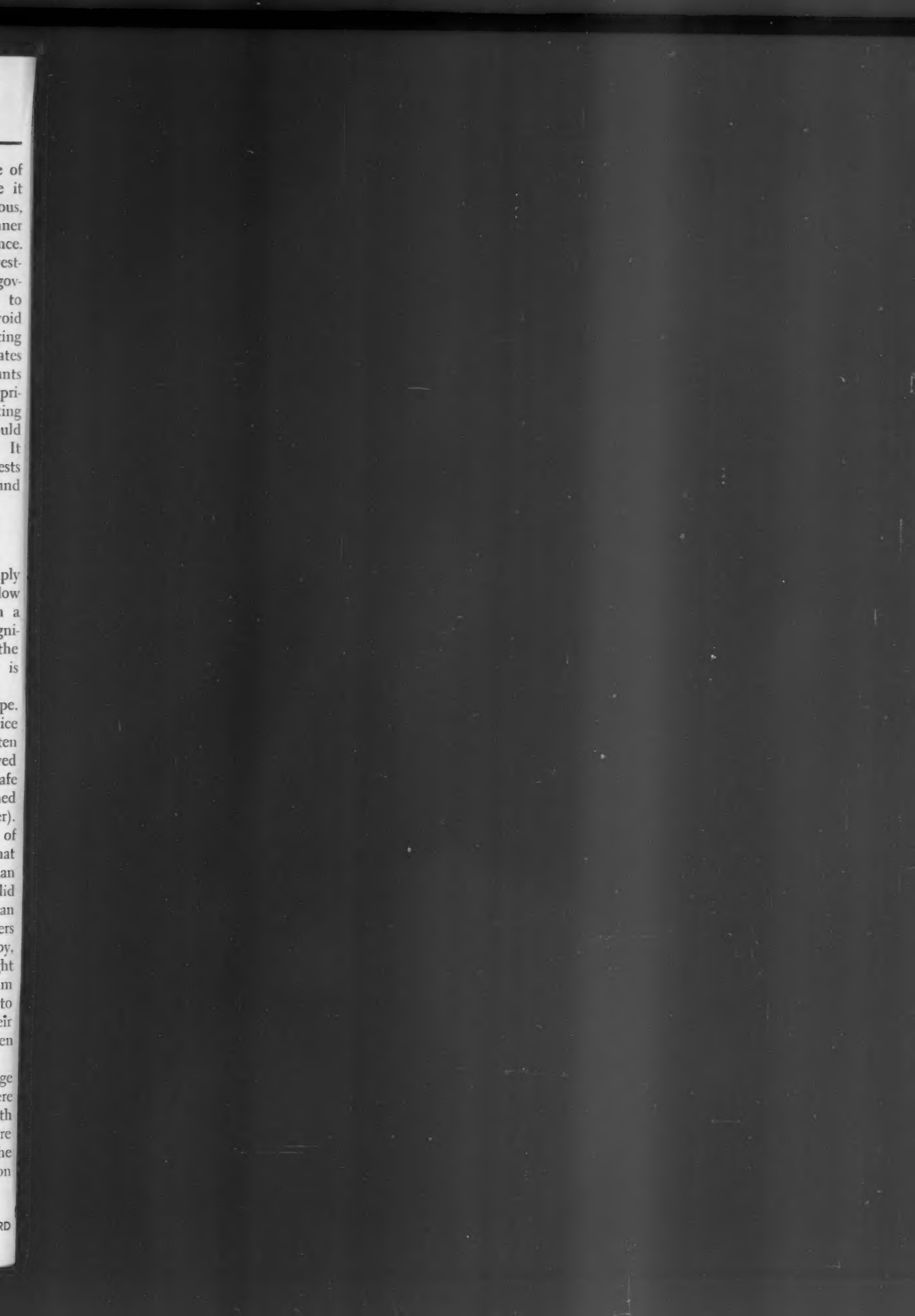
This danger is now being encountered in Iraq, whose excellent development prospects have recently been outlined in articles in these pages. Because Iraq is one of our best friends in the Middle East, and because it has within its power to become permanently prosperous, not just temporarily, oil-money prosperous, the manner in which it tackles its problem is of utmost importance.

Iraq's problem centers on its plan for huge investment in new irrigation schemes to bring unused government land under cultivation and distribute it to presently landless peasants. But there is no way to avoid improving the land of existing big estates, while getting the water to government land. So, unless the estates pay for the improvements to their lands, sizable amounts of development funds will be diverted from their primary purpose. Iraq's Development Board is working hard to get a measure passed by Parliament, which would place irrigation benefits on an ability-to-pay basis. It is the fervent hope of all who have the best interests of Iraq at heart that enough statesmanship will be found to assure that the measure will be passed.

Is That Test Necessary?

WHEN OPENING A NEW BRIDGE, we in the U.S. simply stretch a ribbon across the roadway, and amidst a flow of oratory, usually political in nature, snip it with a pair of shears. A line of black limousines, carrying dignitaries—and in extreme cases even the engineer and the contractor—then passes over the structure, and it is open to traffic.

Such a simple ceremony is unheard of in Europe. Although something resembling the American practice may sometimes occur, it is always preceded by and often completely replaced by a live load test. The avowed purpose, of course, is to prove that the bridge is safe (which it always is) and to compare actual with designed deflections (which are never far enough apart to matter).

There has always been a suspicion on the part of Americans, who have thought about the subject, that European bridge testing has more of a theatrical than a technical reason behind it. This view now gains solid support from a test recently carried out on a pedestrian bridge in London's St. James Park. With road rollers out of the question and pedestrians hard to come by, the live load test was in jeopardy until someone thought of the Army. The result: three hundred Coldstream Guards were marched onto the bridge, and ordered to do their famous "about face" in which they bring their boots down in three crashing steps. It must have been quite a show.

Maybe a bit more pageantry would get the new bridge at Six Corner, U.S.A., off to a better start than the mere cutting of a ribbon. Certainly a battalion of troops with banners flying and drums beating would make a more lasting impression on the public than some of the speeches by which our bridges usually are launched on their life work.